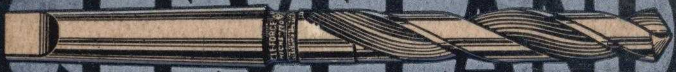
# THE CLEVELAND



## TWIST DRILL COMPANY

## CATALOG No. 43

SOCKETS
Pages 5-9

DRILLS and SETS
Pages 12-56

COUNTERSINKS
Pages 59-61

REAMERS and SETS
Pages 62-138

MISCELLANEOUS TOOLS
Pages 139-163

MILLIMETER SIZES
Pages 164-172

MECHANICAL DATA
Pages 173-200

PRIVATE CODE
Pages 201-219

INDEX
Pages 221-240

8994

# GENERAL INDEX

Page Nos.

SOCKETS 5-9

•

TWIST DRILLS 12-46
  Drill Sets 47-56
  M/M Sizes 164-171

•

COUNTERSINKS 59-61

•

REAMERS 62-138
  Adjustable (See Index Page 225)
  M/M Sizes 172
  "Cleveland" High Speed Adjustable 118-128
  "Peerless" High Speed 98-115
  "Paradox" Adjustable 130-136
  "Quick-Set" Adjustable 91-94
  Sets, Reamer 93-94-95

•

MISCELLANEOUS TOOLS
  Counterbores 144-151
  End Mills 156-163
  Hollow Mills 154-155
  Lathe Centers 152
  Mandrels 153
  Screw Extractors 140-143

•

MILLIMETER SIZES
  Twist Drills 164-171
  Reamers 172

•

MECHANICAL DATA 173-200
  Suggestions for Ordering 174-175

•

PRIVATE CODE 201-219

•

INDEX, ALPHABETICAL 221-229
INDEX, NUMERICAL 230-240

•

*For Adjustable and Expansion Type Reamers,*
*See Index Page 225.*

SOCKETS
Pages 5-9

DRILLS and SETS
Pages 12-56

COUNTERSINKS
Pages 59-61

REAMERS
and SETS
Pages 62-138

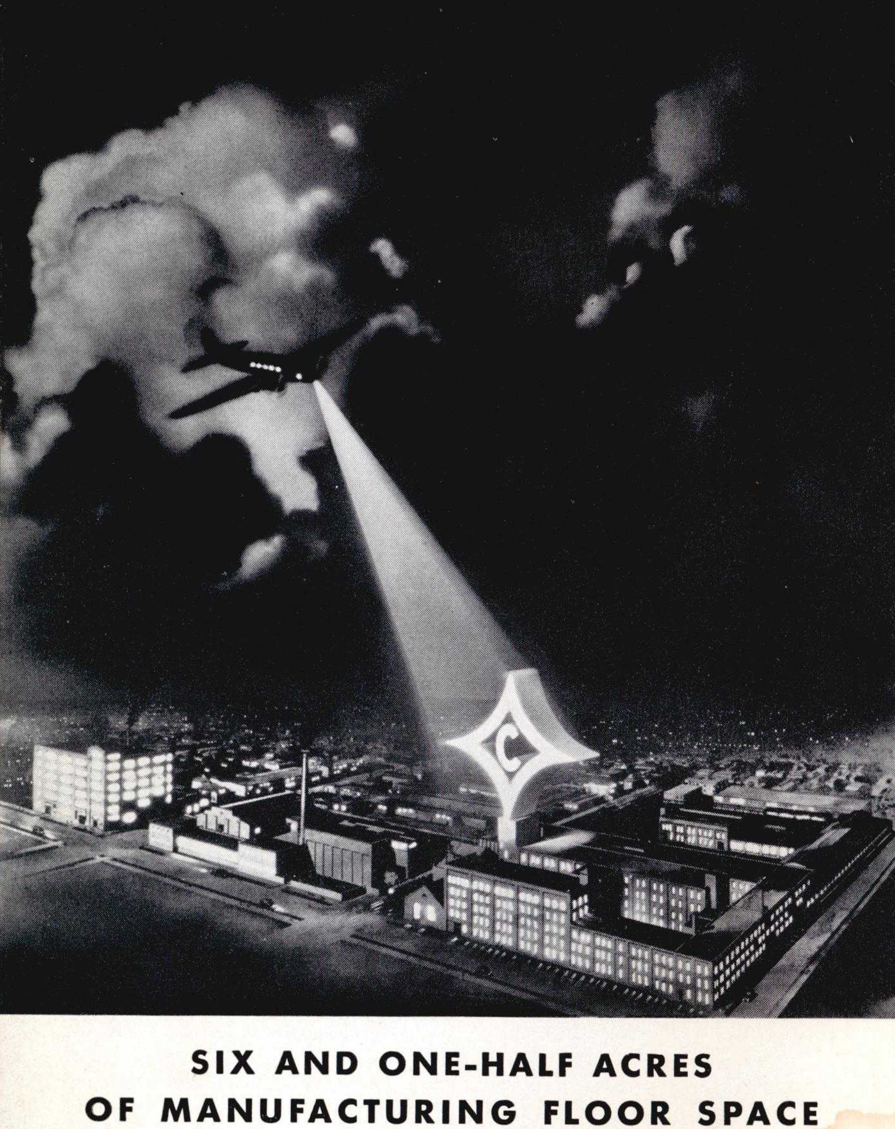
MISCELLANEOUS
TOOLS
Pages 139-163

MILLIMETER
SIZES
Pages 164-172

MECHANICAL
DATA
Pages 173-200

PRIVATE CODE
Pages 201-219

INDEX
Pages 221-240



## SIX AND ONE-HALF ACRES OF MANUFACTURING FLOOR SPACE

●

**OUR TRADE MARK—SHOWN ABOVE—
WILL ALWAYS IDENTIFY OUR TOOLS**

*Registered in the United States Patent Office and in all principal foreign countries.*

10

# THE CLEVELAND TWIST DRILL CO.

**ESTABLISHED 1876 . . . . INCORPORATED 1904**

*Manufacturers of . . .*

## DRILLS • REAMERS
## SCREW EXTRACTORS
## ARBORS • MANDRELS
## SOCKETS • MILLS
## COUNTERBORES

•

## HIGH SPEED TOOLS

•

**CATALOG 43**

**FACTORY AND OFFICE • CLEVELAND, OHIO**

*Complete Stocks Carried at*

| | |
|---|---|
| NEW YORK | 30 READE ST. |
| CHICAGO | 9 NORTH JEFFERSON ST. |
| SAN FRANCISCO | 654 HOWARD ST. |
| DETROIT | 6515 SECOND BLVD. |

•

LONDON . . . . . E. P. BARRUS, LIMITED
35-36-37 UPPER THAMES STREET, LONDON, E. C. 4

Copyright, 1935

**The CLEVELAND TWIST DRILL CO.**

# To our friends

- We take considerable pleasure and pride in handing you our new Catalog No. 43.

In keeping with the high quality of "Cleveland" Twist Drills and Reamers, we have endeavored to make Catalog No. 43 a complete and concise book of information about our products to all classes of trade.

We are confident that mechanical and purchasing departments will find it useful as a reference book, and will appreciate its simplified index.

"Cleveland" quality and service are at your command not only from the factory, but also from strategically located Stockrooms in New York, Chicago, San Francisco and Detroit.

This mark of excellence ◆ always has, and always will, identify our tools.

*"Cleveland" Distributors everywhere are ready to serve you.*

**The CLEVELAND TWIST DRILL COMPANY**
1242 EAST 49th STREET
CLEVELAND
TRADE MARK REG. U. S. PAT. OFF. AND FOREIGN COUNTRIES
30 READE ST. NEW YORK
9 NORTH JEFFERSON ST. CHICAGO
654 HOWARD ST. SAN FRANCISCO
6515 SECOND BLVD., DETROIT
LONDON - 35-36-37 UPPER THAMES ST., E.C.4

# SOCKETS

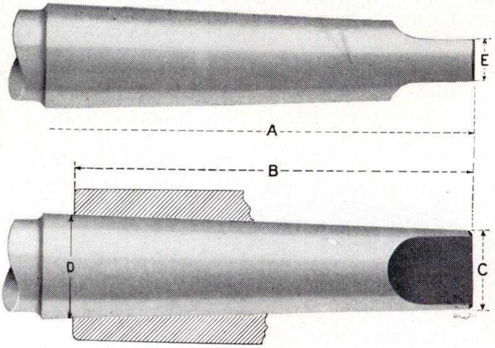
FOR ALPHABETICAL INDEX, SEE PAGES 221-229

FOR NUMERICAL INDEX, SEE PAGES 230-240

CLEVELAND

TRADE MARK REG. U. S. PAT. OFF. AND FOREIGN COUNTRIES

# Taper Shanks



## Dimensions

| No. | A<br>Inches | B<br>Inches | C<br>Inches | D<br>Inches | E<br>Inches | Taper in 12 Inches |
|---|---|---|---|---|---|---|
| 1 | 2 9/16 | 2 7/16 | .353 | .475 | 13/64 | .600 in. |
| 2 | 3⅛ | 2 15/16 | .553 | .700 | ¼ | .602 in. |
| 3 | 3⅞ | 3 11/16 | .753 | .938 | 5/16 | .602 in. |
| 4 | 4⅞ | 4⅝ | .991 | 1.231 | 15/32 | .623 in. |
| 5 | 6⅛ | 5⅞ | 1.440 | 1.748 | ⅝ | .630 in. |
| 6 | 8 9/16 | 8¼ | 2.064 | 2.494 | ¾ | .626 in. |

# Steel Sockets for Taper Shank Tools

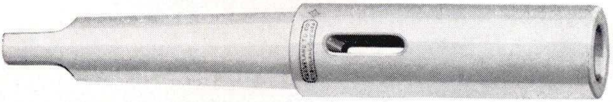
## Rough Sockets—List No. 100

**Code Word—LABEGANDER**

| Size No. | Price Each | | Length Overall Inches | Diameter of Shank Inches |
|---|---|---|---|---|
| **1** | $1.20 | Holds Tools according to shank sizes shown under drill listings. | 7½ | 1⅛ |
| **2** | 1.80 | | 8 | 1¼ |
| **3** | 2.50 | | 10 | 1½ |
| **4** | 4.00 | | 12½ | 2 |
| **5** | 7.50 | | 16 | 2¾ |
| **6** | 14.00 | | 19 | 3¾ |

## Fitted Sockets—List No. 102

**Code Word—LABEGAWN**



| Size No. | Description | Length Overall Inches | Price Each |
|---|---|---|---|
| 1 to 2 | Has No. 1 Hole and No. 2 Shank...... | 6¾ | $2.00 |
| 1 to 3 | “ “ 1 “ “ “ 3 “ ...... | 7½ | 2.50 |
| 1 to 4 | “ “ 1 “ “ “ 4 “ ...... | 8¾ | 3.20 |
| 1 to 5 | “ “ 1 “ “ “ 5 “ ...... | 10 | 4.80 |
| 2 to 2 | “ “ 2 “ “ “ 2 “ ...... | 7½ | 2.50 |
| 2 to 3 | “ “ 2 “ “ “ 3 “ ...... | 8 | 2.50 |
| 2 to 4 | “ “ 2 “ “ “ 4 “ ...... | 9¼ | 3.20 |
| 2 to 5 | “ “ 2 “ “ “ 5 “ ...... | 10¾ | 4.80 |
| 3 to 2 | “ “ 3 “ “ “ 2 “ ...... | 8¼ | 3.20 |
| 3 to 3 | “ “ 3 “ “ “ 3 “ ...... | 9 | 3.20 |
| 3 to 4 | “ “ 3 “ “ “ 4 “ ...... | 10 | 3.20 |
| 3 to 5 | “ “ 3 “ “ “ 5 “ ...... | 11½ | 4.80 |
| 4 to 3 | “ “ 4 “ “ “ 3 “ ...... | 10⅝ | 4.80 |
| 4 to 4 | “ “ 4 “ “ “ 4 “ ...... | 11⅝ | 4.80 |
| 4 to 5 | “ “ 4 “ “ “ 5 “ ...... | 12½ | 4.80 |
| 4 to 6 | “ “ 4 “ “ “ 6 “ ...... | 16 | 12.00 |
| 5 to 4 | “ “ 5 “ “ “ 4 “ ...... | 13⅛ | 12.00 |
| 5 to 5 | “ “ 5 “ “ “ 5 “ ...... | 14½ | 12.00 |
| 5 to 6 | “ “ 5 “ “ “ 6 “ ...... | 16 | 12.00 |

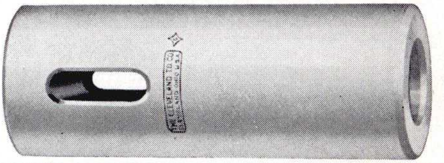
For dimensions of Taper Shanks, see pages 6 and 189.

*“Speed and Feed Table” on page 179*

# Steel Sockets for Taper Shank Tools

## Screw Machine Sockets—List No. 103

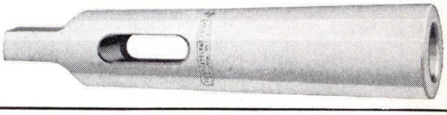
**Code Word—LABEJEAN**



| Size | Size Hole No. | O. D. | Overall | Price Each |
|---|---|---|---|---|
| A | 1 | 1″ | 3½″ | $2.50 |
| B | 1 | 1¼″ | 3½″ | 2.70 |
| C | 1 | 1½″ | 3½″ | 2.90 |
| D | 2 | 1″ | 4″ | 2.90 |
| E | 2 | 1¼″ | 4″ | 3.20 |
| F | 2 | 1½″ | 4″ | 3.40 |
| G | 2 | 1¾″ | 4″ | 3.70 |
| H | 2 | 2″ | 4″ | 3.90 |
| J | 3 | 1¼″ | 4¾″ | 3.90 |
| K | 3 | 1½″ | 4¾″ | 4.20 |
| L | 3 | 1¾″ | 4¾″ | 4.60 |
| M | 3 | 2″ | 4¾″ | 5.00 |
| N | 4 | 1½″ | 6″ | 5.00 |
| P | 4 | 1¾″ | 6″ | 5.40 |
| Q | 4 | 2″ | 6″ | 5.80 |

## Sleeve or Shell Sockets—List No. 104

**Code Word—LABEJEFT**



| Size No. | Description | Price Each |
|---|---|---|
| 1 to 2 | Has No. 1 Hole and outside fitting No. 2 Socket | $1.80 |
| 1 to 3 | “ “ 1 “ “ “ “ “ 3 “ | 2.40 |
| 1 to 4 | “ “ 1 “ “ “ “ “ 4 “ | 3.00 |
| 1 to 5 | “ “ 1 “ “ “ “ “ 5 “ | 4.40 |
| 2 to 3 | “ “ 2 “ “ “ “ “ 3 “ | 2.40 |
| 2 to 4 | “ “ 2 “ “ “ “ “ 4 “ | 3.00 |
| 2 to 5 | “ “ 2 “ “ “ “ “ 5 “ | 4.40 |
| 3 to 4 | “ “ 3 “ “ “ “ “ 4 “ | 3.00 |
| 3 to 5 | “ “ 3 “ “ “ “ “ 5 “ | 4.40 |
| 4 to 5 | “ “ 4 “ “ “ “ “ 5 “ | 4.40 |
| 4 to 6 | “ “ 4 “ “ “ “ “ 6 “ | 10.00 |
| 5 to 6 | “ “ 5 “ “ “ “ “ 6 “ | 10.00 |

For dimensions of Taper Shanks, see pages 6 and 189.

*Always Give List Number When Ordering*

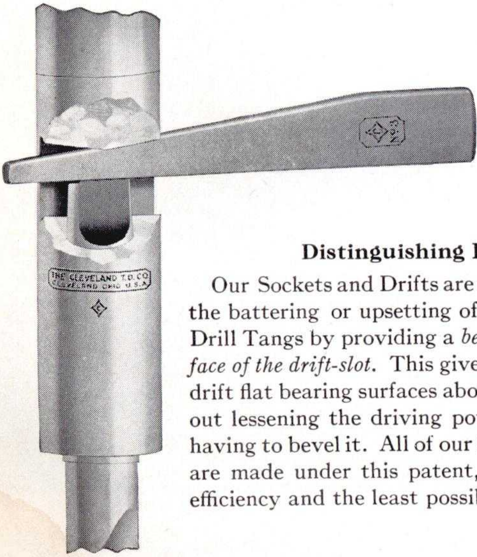
# Drifts or Center Keys—List No. 105

**Code Word—LABEJOHN**

**Drop Forged and Hardened**

| Size No. | Description | Price Each |
|---|---|---|
| 1 | Fitting No. 1 Sockets and Sleeves............ | $.30 |
| 2 | " " 2 " " " ............ | .35 |
| 3 | " " 3 " " " ............ | .40 |
| 4 | " " 4, 5 and 6 Sockets and Sleeves...... | .50 |

## Sectional View Showing Construction of Our Patented Sockets with Drift Inserted



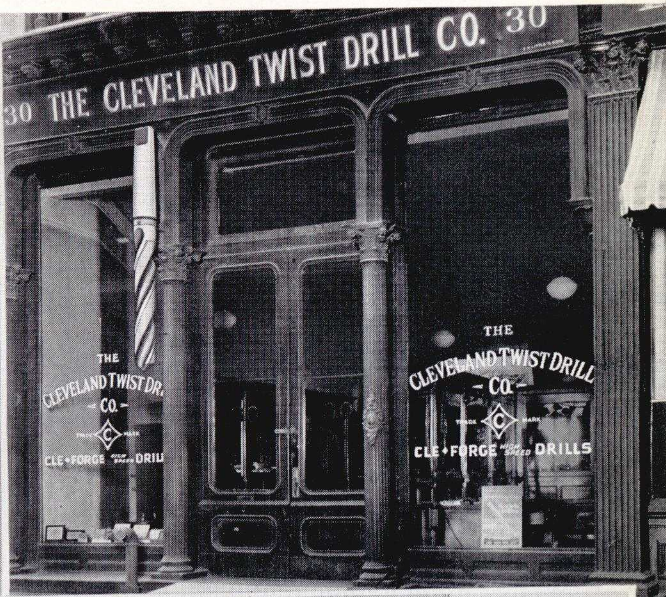
### Distinguishing Feature

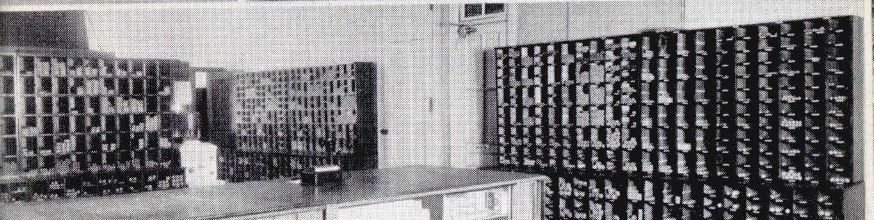
Our Sockets and Drifts are designed to prevent the battering or upsetting of the corners of the Drill Tangs by providing a *bevel in the upper surface of the drift-slot.* This gives the wedge-shaped drift flat bearing surfaces above and below, without lessening the driving power of the tang by having to bevel it. All of our Sockets and Sleeves are made under this patent, insuring increased efficiency and the least possible wear.

*Always Give List Number When Ordering*

**NEW YORK STOCKROOM • • ESTABLISHED MAY 1, 1895 FOR THE PURPOSE OF FILLING ALL STOCK ORDERS FOR DISTRIBUTORS IN NEW ENGLAND, AND ALONG THE ATLANTIC SEABOARD AS FAR SOUTH AS NORFOLK, VA.**

# CARBON AND HIGH SPEED DRILLS—AND SETS


30 THE CLEVELAND TWIST DRILL CO. 30
THE CLEVELAND TWIST DRILL CO.
TRADE MARK
CLE-FORGE HIGH SPEED DRILLS
THE CLEVELAND TWIST DRILL CO.
TRADE MARK
CLE-FORGE HIGH SPEED DRILLS



FOR ALPHABETICAL INDEX, SEE PAGES 221-229

FOR NUMERICAL INDEX, SEE PAGES 230-240

# CLE-FORGE HIGH SPEED DRILLS

TRADE MARK REG. U.S. PAT. OFF.

THE Cleveland Twist Drill Company introduced the "Cle-Forge" High Speed Drill in 1922. It was both forged and milled, thereby incorporating into one tool both the toughness of the forged type and the accuracy of the milled type. This combination of the best qualities of the two types marked a distinct contribution to the art of drilling, and met with the immediate approval of all drill users.

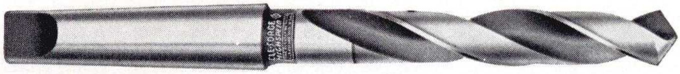
Today the "Cle-Forge" High Speed Drill is made by the same fundamental method used when it was originally developed. However, we have not been content to rest upon past successes. Our metallurgists and engineers are continually studying steel, mechanical construction and methods of manufacture. Their experiments have led to refinements in the original process and, year by year, the "Cle-Forge" High Speed Drill has been improved up to its present high quality.

In any plant the selection of the proper drill is a matter of great importance. The original cost of a drill does not determine its value. The holes per dollar expended, or the cost per hole, should be the deciding factor in the choice of drills. We believe that "Cle-Forge" High Speed Drills will speak for themselves in this matter by producing holes cheaper and faster.

# CLE-FORGE HIGH SPEED DRILLS

TRADE MARK REG. U.S. PAT. OFF.

## Taper Shank



## Shanks Regular—List No. 940

Code Word—MAJOR

## Shanks Smaller than Regular—List No. 941

Code Word—MAJORITY

## Shanks Larger than Regular—List No. 942

Code Word—MAKER

| | List No. 940 Shanks Regular | | | List No. 941 Shanks Smaller | | | List No. 942 Shanks Larger | | |
|---|---|---|---|---|---|---|---|---|---|
| Diam. Inches | Price Each | Length Overall Inches | Shank Taper No. | Price Each | Length Overall Inches | Shank Taper No. | Price Each | Length Overall Inches | Shank Taper No. |
| 1/8 | $1.00 | 5 1/8 | 1 | .... | .... | .... | .... | .... | .... |
| 9/64 | 1.10 | 5 3/8 | 1 | .... | .... | .... | .... | .... | .... |
| 5/32 | 1.10 | 5 3/8 | 1 | .... | .... | .... | .... | .... | .... |
| 11/64 | 1.25 | 5 3/4 | 1 | .... | .... | .... | .... | .... | .... |
| 3/16 | 1.25 | 5 3/4 | 1 | .... | .... | .... | .... | .... | .... |
| 13/64 | 1.35 | 6″ | 1 | .... | .... | .... | .... | .... | .... |
| 7/32 | 1.35 | 6″ | 1 | .... | .... | .... | .... | .... | .... |
| 15/64 | 1.40 | 6 1/8 | 1 | .... | .... | .... | .... | .... | .... |
| 1/4 | 1.40 | 6 1/8 | 1 | .... | .... | .... | .... | .... | .... |
| 17/64 | 1.50 | 6 1/4 | 1 | .... | .... | .... | .... | .... | .... |
| 9/32 | 1.50 | 6 1/4 | 1 | .... | .... | .... | .... | .... | .... |
| 19/64 | 1.60 | 6 3/8 | 1 | .... | .... | .... | .... | .... | .... |
| 5/16 | 1.60 | 6 3/8 | 1 | .... | .... | .... | .... | .... | .... |
| 21/64 | 1.70 | 6 1/2 | 1 | .... | .... | .... | .... | .... | .... |
| 11/32 | 1.70 | 6 1/2 | 1 | .... | .... | .... | .... | .... | .... |
| 23/64 | 1.90 | 6 3/4 | 1 | .... | .... | .... | .... | .... | .... |
| 3/8 | 1.90 | 6 3/4 | 1 | .... | .... | .... | $2.10 | 7 3/8 | 2 |
| 25/64 | 2.10 | 7″ | 1 | .... | .... | .... | 2.25 | 7 1/2 | 2 |
| 13/32 | 2.10 | 7″ | 1 | .... | .... | .... | 2.25 | 7 1/2 | 2 |
| 27/64 | 2.30 | 7 1/4 | 1 | .... | .... | .... | 2.45 | 7 3/4 | 2 |

Continued on next page

**Shanks Regular—List No. 940, will be supplied unless otherwise specified.**

*Always Give List Number When Ordering*

# CLE-FORGE HIGH SPEED DRILLS

TRADE MARK REG. U.S. PAT. OFF.

## Taper Shank (*Continued*)

| | List No. 940<br>Shanks Regular | | | List No. 941<br>Shanks Smaller | | | List No. 942<br>Shanks Larger | | |
|---|---|---|---|---|---|---|---|---|---|
| Diam. Inches | Price Each | Length Overall Inches | Shank Taper No. | Price Each | Length Overall Inches | Shank Taper No. | Price Each | Length Overall Inches | Shank Taper No. |
| 7/16 | $2.30 | 7¼ | 1 | .... | .... | .... | $2.45 | 7¾ | 2 |
| 29/64 | 2.50 | 7½ | 1 | .... | .... | .... | 2.65 | 8″ | 2 |
| 15/32 | 2.50 | 7½ | 1 | .... | .... | .... | 2.65 | 8″ | 2 |
| 31/64 | 2.95 | 8¼ | 2 | $2.75 | 7¾ | 1 | .... | .... | .... |
| ½ | 2.95 | 8¼ | 2 | 2.75 | 7¾ | 1 | .... | .... | .... |
| 33/64 | 3.25 | 8½ | 2 | 3.05 | 8″ | 1 | .... | .... | .... |
| 17/32 | 3.25 | 8½ | 2 | 3.05 | 8″ | 1 | .... | .... | .... |
| 35/64 | 3.75 | 8¾ | 2 | 3.50 | 8¼ | 1 | .... | .... | .... |
| 9/16 | 3.75 | 8¾ | 2 | 3.50 | 8¼ | 1 | .... | .... | .... |
| 37/64 | 4.00 | 8¾ | 2 | .... | .... | .... | .... | .... | .... |
| 19/32 | 4.00 | 8¾ | 2 | .... | .... | .... | .... | .... | .... |
| 39/64 | 4.25 | 8¾ | 2 | .... | .... | .... | .... | .... | .... |
| ⅝ | 4.25 | 8¾ | 2 | .... | .... | .... | .... | .... | .... |
| 41/64 | 4.75 | 9″ | 2 | .... | .... | .... | 5.15 | 9¾ | 3 |
| 21/32 | 4.75 | 9″ | 2 | .... | .... | .... | 5.15 | 9¾ | 3 |
| 43/64 | 5.25 | 9¼ | 2 | .... | .... | .... | 5.70 | 10″ | 3 |
| 11/16 | 5.25 | 9¼ | 2 | .... | .... | .... | 5.70 | 10″ | 3 |
| 45/64 | 5.75 | 9½ | 2 | .... | .... | .... | 6.20 | 10¼ | 3 |
| 23/32 | 5.75 | 9½ | 2 | .... | .... | .... | 6.20 | 10¼ | 3 |
| 47/64 | 6.25 | 9¾ | 2 | .... | .... | .... | 6.75 | 10½ | 3 |
| ¾ | 6.25 | 9¾ | 2 | .... | .... | .... | 6.75 | 10½ | 3 |
| 49/64 | 6.50 | 9⅞ | 2 | .... | .... | .... | 7.00 | 10⅝ | 3 |
| 25/32 | 6.50 | 9⅞ | 2 | .... | .... | .... | 7.00 | 10⅝ | 3 |
| 51/64 | 7.25 | 10¾ | 3 | 6.75 | 10″ | 2 | .... | .... | .... |
| 13/16 | 7.25 | 10¾ | 3 | 6.75 | 10″ | 2 | .... | .... | .... |
| 53/64 | 7.65 | 10¾ | 3 | 7.15 | 10″ | 2 | .... | .... | .... |
| 27/32 | 7.65 | 10¾ | 3 | 7.15 | 10″ | 2 | .... | .... | .... |
| 55/64 | 8.05 | 10¾ | 3 | 7.50 | 10″ | 2 | .... | .... | .... |
| ⅞ | 8.05 | 10¾ | 3 | 7.50 | 10″ | 2 | .... | .... | .... |
| 57/64 | 8.45 | 10¾ | 3 | 7.85 | 10″ | 2 | .... | .... | .... |
| 29/32 | 8.45 | 10¾ | 3 | 7.85 | 10″ | 2 | .... | .... | .... |

Continued on next page

**Shanks Regular — List No. 940, will be supplied unless otherwise specified.**

***Always Give List Number When Ordering***

# CLE-FORGE HIGH SPEED DRILLS

TRADE MARK REG. U.S. PAT. OFF.

## Taper Shank (*Continued*)

| | **List No. 940** Shanks Regular | | | **List No. 941** Shanks Smaller | | | **List No. 942** Shanks Larger | | |
|---|---|---|---|---|---|---|---|---|---|
| Diam. Inches | Price Each | Length Overall Inches | Shank Taper No. | Price Each | Length Overall Inches | Shank Taper No. | Price Each | Length Overall Inches | Shank Taper No. |
| $\frac{59}{64}$ | $ 8.85 | 10¾ | 3 | .... | .... | .... | .... | .... | .... |
| $\frac{15}{16}$ | 8.85 | 10¾ | 3 | .... | .... | .... | .... | .... | .... |
| $\frac{61}{64}$ | 9.65 | 11″ | 3 | .... | .... | .... | .... | .... | .... |
| $\frac{31}{32}$ | 9.65 | 11″ | 3 | .... | .... | .... | .... | .... | .... |
| $\frac{63}{64}$ | 10.25 | 11″ | 3 | .... | .... | .... | .... | .... | .... |
| 1″ | 10.25 | 11″ | 3 | .... | .... | .... | $11.20 | 12″ | 4 |
| $1\frac{1}{64}$ | 11.00 | 11⅛ | 3 | .... | .... | .... | 12.00 | 12⅛ | 4 |
| $1\frac{1}{32}$ | 11.00 | 11⅛ | 3 | .... | .... | .... | 12.00 | 12⅛ | 4 |
| $1\frac{3}{64}$ | 11.75 | 11¼ | 3 | .... | .... | .... | 12.80 | 12¼ | 4 |
| $1\frac{1}{16}$ | 11.75 | 11¼ | 3 | .... | .... | .... | 12.80 | 12¼ | 4 |
| $1\frac{5}{64}$ | 13.25 | 12½ | 4 | $12.20 | 11½ | 3 | .... | .... | .... |
| $1\frac{3}{32}$ | 13.25 | 12½ | 4 | 12.20 | 11½ | 3 | .... | .... | .... |
| $1\frac{7}{64}$ | 14.25 | 12¾ | 4 | 13.15 | 11¾ | 3 | .... | .... | .... |
| 1⅛ | 14.25 | 12¾ | 4 | 13.15 | 11¾ | 3 | .... | .... | .... |
| $1\frac{9}{64}$ | 15.00 | 12⅞ | 4 | 13.85 | 11⅞ | 3 | .... | .... | .... |
| $1\frac{5}{32}$ | 15.00 | 12⅞ | 4 | 13.85 | 11⅞ | 3 | .... | .... | .... |
| $1\frac{11}{64}$ | 15.75 | 13″ | 4 | 14.55 | 12″ | 3 | .... | .... | .... |
| $1\frac{3}{16}$ | 15.75 | 13″ | 4 | 14.55 | 12″ | 3 | .... | .... | .... |
| $1\frac{13}{64}$ | 16.50 | 13⅛ | 4 | 15.25 | 12⅛ | 3 | .... | .... | .... |
| $1\frac{7}{32}$ | 16.50 | 13⅛ | 4 | 15.25 | 12⅛ | 3 | .... | .... | .... |
| $1\frac{15}{64}$ | 18.00 | 13½ | 4 | 16.65 | 12½ | 3 | .... | .... | .... |
| 1¼ | 18.00 | 13½ | 4 | 16.65 | 12½ | 3 | .... | .... | .... |
| $1\frac{17}{64}$ | 20.00 | 14⅛ | 4 | .... | .... | .... | .... | .... | .... |
| $1\frac{9}{32}$ | 20.00 | 14⅛ | 4 | .... | .... | .... | .... | .... | .... |
| $1\frac{19}{64}$ | 20.75 | 14¼ | 4 | .... | .... | .... | .... | .... | .... |
| $1\frac{5}{16}$ | 20.75 | 14¼ | 4 | .... | .... | .... | .... | .... | .... |
| $1\frac{21}{64}$ | 21.50 | 14⅜ | 4 | .... | .... | .... | .... | .... | .... |
| $1\frac{11}{32}$ | 21.50 | 14⅜ | 4 | .... | .... | .... | .... | .... | .... |
| $1\frac{23}{64}$ | 22.25 | 14½ | 4 | .... | .... | .... | .... | .... | .... |
| 1⅜ | 22.25 | 14½ | 4 | .... | .... | .... | .... | .... | .... |

**Continued on next page**

**Shanks Regular — List No. 940, will be supplied unless otherwise specified.**

***Always Give List Number When Ordering***

# CLE-FORGE HIGH SPEED DRILLS

TRADE MARK REG. U.S. PAT. OFF

## Taper Shank (*Continued*)

| | List No. 940 Shanks Regular | | | List No. 941 Shanks Smaller | | | List No. 942 Shanks Larger | | |
|---|---|---|---|---|---|---|---|---|---|
| Diam. Inches | Price Each | Length Overall Inches | Shank Taper No. | Price Each | Length Overall Inches | Shank Taper No. | Price Each | Length Overall Inches | Shank Taper No. |
| 1$\frac{25}{64}$ | $23.00 | 14⅝ | 4 | .... | .... | .... | .... | .... | .... |
| 1$\frac{13}{32}$ | 23.00 | 14⅝ | 4 | .... | .... | .... | .... | .... | .... |
| 1$\frac{27}{64}$ | 23.75 | 14¾ | 4 | .... | .... | .... | .... | .... | .... |
| 1$\frac{7}{16}$ | 23.75 | 14¾ | 4 | .... | .... | .... | .... | .... | .... |
| 1$\frac{29}{64}$ | 24.50 | 14⅞ | 4 | .... | .... | .... | .... | .... | .... |
| 1$\frac{15}{32}$ | 24.50 | 14⅞ | 4 | .... | .... | .... | .... | .... | .... |
| 1$\frac{31}{64}$ | 25.25 | 15″ | 4 | .... | .... | .... | .... | .... | .... |
| 1½ | 25.25 | 15″ | 4 | .... | .... | .... | .... | .... | .... |
| 1$\frac{33}{64}$ | 28.75 | 16⅜ | 5 | $26.35 | 15″ | 4 | .... | .... | .... |
| 1$\frac{17}{32}$ | 28.75 | 16⅜ | 5 | 26.35 | 15″ | 4 | .... | .... | .... |
| 1$\frac{35}{64}$ | 30.75 | 16⅝ | 5 | 28.20 | 15¼ | 4 | .... | .... | .... |
| 1$\frac{9}{16}$ | 30.75 | 16⅝ | 5 | 28.20 | 15¼ | 4 | .... | .... | .... |
| 1$\frac{37}{64}$ | 32.75 | 16⅞ | 5 | 30.10 | 15½ | 4 | .... | .... | .... |
| 1$\frac{19}{32}$ | 32.75 | 16⅞ | 5 | 30.10 | 15½ | 4 | .... | .... | .... |
| 1$\frac{39}{64}$ | 34.00 | 17″ | 5 | 31.25 | 15⅝ | 4 | .... | .... | .... |
| 1⅝ | 34.00 | 17″ | 5 | 31.25 | 15⅝ | 4 | .... | .... | .... |
| 1$\frac{41}{64}$ | 35.25 | 17⅛ | 5 | 32.40 | 15¾ | 4 | .... | .... | .... |
| 1$\frac{21}{32}$ | 35.25 | 17⅛ | 5 | 32.40 | 15¾ | 4 | .... | .... | .... |
| 1$\frac{43}{64}$ | 36.50 | 17⅛ | 5 | 33.55 | 15¾ | 4 | .... | .... | .... |
| 1$\frac{11}{16}$ | 36.50 | 17⅛ | 5 | 33.55 | 15¾ | 4 | .... | .... | .... |
| 1$\frac{45}{64}$ | 37.75 | 17⅛ | 5 | 34.70 | 15¾ | 4 | .... | .... | .... |
| 1$\frac{23}{32}$ | 37.75 | 17⅛ | 5 | 34.70 | 15¾ | 4 | .... | .... | .... |
| 1$\frac{47}{64}$ | 39.00 | 17⅛ | 5 | 37.00 | 16¼ | 4 | .... | .... | .... |
| 1¾ | 39.00 | 17⅛ | 5 | 37.00 | 16¼ | 4 | .... | .... | .... |
| 1$\frac{25}{32}$ | 40.25 | 17⅛ | 5 | 38.20 | 16¼ | 4 | .... | .... | .... |
| 1$\frac{13}{16}$ | 41.50 | 17⅛ | 5 | 39.40 | 16¼ | 4 | .... | .... | .... |
| 1$\frac{27}{32}$ | 42.75 | 17⅛ | 5 | 40.55 | 16¼ | 4 | .... | .... | .... |
| 1⅞ | 45.00 | 17⅜ | 5 | 42.75 | 16½ | 4 | .... | .... | .... |
| 1$\frac{29}{32}$ | 46.25 | 17⅜ | 5 | 43.95 | 16½ | 4 | .... | .... | .... |
| 1$\frac{15}{16}$ | 47.50 | 17⅜ | 5 | 45.45 | 16⅝ | 4 | .... | .... | .... |
| 1$\frac{31}{32}$ | 48.75 | 17⅜ | 5 | 46.65 | 16⅝ | 4 | .... | .... | .... |
| 2″ | 50.00 | 17⅜ | 5 | 47.85 | 16⅝ | 4 | .... | .... | .... |

Continued on next page

**Shanks Regular—List No. 940, will be supplied unless otherwise specified.**

*Always Give List Number When Ordering*

# CLE◆FORGE HIGH SPEED DRILLS

TRADE MARK REG. U.S. PAT. OFF.

## Taper Shank (*Continued*)

| | List No. 940 Shanks Regular | | | List No. 941 Shanks Smaller | | | List No. 942 Shanks Larger | | |
|---|---|---|---|---|---|---|---|---|---|
| Diam. Inches | Price Each | Length Overall Inches | Shank Taper No. | Price Each | Length Overall Inches | Shank Taper No. | Price Each | Length Overall Inches | Shank Taper No. |
| 2 1/32 | $51.75 | 17 3/8 | 5 | .... | .... | .... | .... | .... | .... |
| 2 1/16 | 53.50 | 17 3/8 | 5 | .... | .... | .... | .... | .... | .... |
| 2 3/32 | 55.25 | 17 3/8 | 5 | .... | .... | .... | .... | .... | .... |
| 2 1/8 | 57.00 | 17 3/8 | 5 | .... | .... | .... | .... | .... | .... |
| 2 5/32 | 58.75 | 17 3/8 | 5 | .... | .... | .... | .... | .... | .... |
| 2 3/16 | 60.50 | 17 3/8 | 5 | .... | .... | .... | .... | .... | .... |
| 2 7/32 | 62.25 | 17 3/8 | 5 | .... | .... | .... | .... | .... | .... |
| 2 1/4 | 64.00 | 17 3/8 | 5 | .... | .... | .... | .... | .... | .... |
| 2 5/16 | 67.50 | 17 3/8 | 5 | .... | .... | .... | .... | .... | .... |
| 2 3/8 | 71.00 | 17 3/8 | 5 | .... | .... | .... | .... | .... | .... |
| 2 7/16 | 87.50 | 18 3/4 | 5 | .... | .... | .... | .... | .... | .... |
| 2 1/2 | 91.00 | 18 3/4 | 5 | .... | .... | .... | .... | .... | .... |
| 2 9/16 | 100.00 | 19 1/2 | 5 | .... | .... | .... | .... | .... | .... |
| 2 5/8 | 105.00 | 19 1/2 | 5 | .... | .... | .... | .... | .... | .... |
| 2 11/16 | 115.50 | 20 3/8 | 5 | .... | .... | .... | .... | .... | .... |
| 2 3/4 | 120.50 | 20 3/8 | 5 | .... | .... | .... | .... | .... | .... |
| 2 13/16 | 129.50 | 21 1/8 | 5 | .... | .... | .... | .... | .... | .... |
| 2 7/8 | 135.00 | 21 1/8 | 5 | .... | .... | .... | .... | .... | .... |
| 2 15/16 | 142.50 | 21 3/4 | 5 | .... | .... | .... | .... | .... | .... |
| 3 | 150.00 | 21 3/4 | 5 | .... | .... | .... | .... | .... | .... |
| 3 1/16 | 178.00 | 24 7/16 | 6 | $160.00 | 22″ | 5 | .... | .... | .... |
| 3 1/8 | 189.00 | 24 7/16 | 6 | 170.00 | 22″ | 5 | .... | .... | .... |
| 3 3/16 | 200.00 | 24 7/16 | 6 | 180.00 | 22″ | 5 | .... | .... | .... |
| 3 1/4 | 216.00 | 25 7/16 | 6 | 195.00 | 23″ | 5 | .... | .... | .... |
| 3 5/16 | 232.00 | 25 7/16 | 6 | 210.00 | 23″ | 5 | .... | .... | .... |
| 3 3/8 | 249.00 | 25 7/16 | 6 | 225.00 | 23″ | 5 | .... | .... | .... |
| 3 7/16 | 266.00 | 25 7/16 | 6 | 240.00 | 23″ | 5 | .... | .... | .... |
| 3 1/2 | 287.00 | 26 7/16 | 6 | 260.00 | 24″ | 5 | .... | .... | .... |

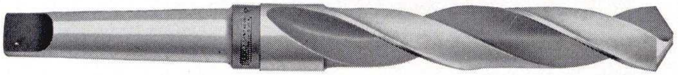
**Shanks Regular—List No. 940, will be supplied unless otherwise specified.**

*Always Give List Number When Ordering*

# Taper Shank Drills

## Carbon Steel No. 106

**Code Word—LABEL**



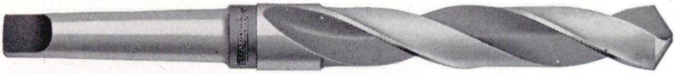
| Diameter Inches | Price Each | Length Overall Inches | Shank Taper | Diameter Inches | Price Each | Length Overall Inches | Shank Taper |
|---|---|---|---|---|---|---|---|
| 1/8 | $.45 | 5 1/8 | No. 1 | 43/64 | $1.80 | 9 1/4 | No. 2 |
| 9/64 | .45 | 5 3/8 | | 11/16 | 1.80 | 9 1/4 | |
| 5/32 | .45 | 5 3/8 | | 45/64 | 1.90 | 9 1/2 | |
| 11/64 | .50 | 5 3/4 | | 23/32 | 1.90 | 9 1/2 | |
| 3/16 | .50 | 5 3/4 | | 47/64 | 2.00 | 9 3/4 | |
| 13/64 | .55 | 6 | | 3/4 | 2.00 | 9 3/4 | |
| 7/32 | .55 | 6 | | 49/64 | 2.10 | 9 7/8 | |
| 15/64 | .60 | 6 1/8 | | 25/32 | 2.10 | 9 7/8 | |
| 1/4 | .60 | 6 1/8 | | 51/64 | 2.20 | 10 | |
| 17/64 | .65 | 6 1/4 | | 13/16 | 2.20 | 10 | |
| 9/32 | .65 | 6 1/4 | | 53/64 | 2.40 | 10 | |
| 19/64 | .70 | 6 3/8 | | 27/32 | 2.40 | 10 | |
| 5/16 | .70 | 6 3/8 | | 55/64 | 2.60 | 10 | |
| 21/64 | .75 | 6 1/2 | | 7/8 | 2.60 | 10 | |
| 11/32 | .75 | 6 1/2 | | 57/64 | 2.80 | 10 | |
| 23/64 | .80 | 6 3/4 | | 29/32 | 2.80 | 10 | |
| 3/8 | .80 | 6 3/4 | | 59/64 | 3.00 | 10 3/4 | No. 3 |
| 25/64 | .90 | 7 | | 15/16 | 3.00 | 10 3/4 | |
| 13/32 | .90 | 7 | | 61/64 | 3.25 | 11 | |
| 27/64 | 1.00 | 7 1/4 | | 31/32 | 3.25 | 11 | |
| 7/16 | 1.00 | 7 1/4 | | 63/64 | 3.50 | 11 | |
| 29/64 | 1.10 | 7 1/2 | | 1″ | 3.50 | 11 | |
| 15/32 | 1.10 | 7 1/2 | | 1 1/64 | 3.75 | 11 1/8 | |
| 31/64 | 1.20 | 7 3/4 | | 1 1/32 | 3.75 | 11 1/8 | |
| 1/2 | 1.20 | 7 3/4 | | 1 3/64 | 4.00 | 11 1/4 | |
| 33/64 | 1.30 | 8 | | 1 1/16 | 4.00 | 11 1/4 | |
| 17/32 | 1.30 | 8 | | 1 5/64 | 4.25 | 11 1/2 | |
| 35/64 | 1.40 | 8 1/4 | | 1 3/32 | 4.25 | 11 1/2 | |
| 9/16 | 1.40 | 8 1/4 | | 1 7/64 | 4.50 | 11 3/4 | |
| 37/64 | 1.50 | 8 3/4 | No. 2 | 1 1/8 | 4.50 | 11 3/4 | |
| 19/32 | 1.50 | 8 3/4 | | 1 9/64 | 4.75 | 11 7/8 | |
| 39/64 | 1.60 | 8 3/4 | | 1 5/32 | 4.75 | 11 7/8 | |
| 5/8 | 1.60 | 8 3/4 | | 1 11/64 | 5.00 | 12 | |
| 41/64 | 1.70 | 9 | | 1 3/16 | 5.00 | 12 | |
| 21/32 | 1.70 | 9 | | | | | |

Continued on next page

# Taper Shank Drills

## Carbon Steel No. 106

**Code Word—LABEL**



| Diameter Inches | Price Each | Length Overall Inches | Shank Taper |
|---|---|---|---|
| 1 13/64 | $5.25 | 12 1/8 | No. 3 |
| 1 7/32 | 5.25 | 12 1/8 | |
| 1 15/64 | 5.50 | 12 1/2 | |
| 1 1/4 | 5.50 | 12 1/2 | |
| 1 17/64 | 5.75 | 14 1/8 | No. 4 |
| 1 9/32 | 5.75 | 14 1/8 | |
| 1 19/64 | 6.00 | 14 1/4 | |
| 1 5/16 | 6.00 | 14 1/4 | |
| 1 21/64 | 6.25 | 14 3/8 | |
| 1 11/32 | 6.25 | 14 3/8 | |
| 1 23/64 | 6.50 | 14 1/2 | |
| 1 3/8 | 6.50 | 14 1/2 | |
| 1 25/64 | 7.00 | 14 5/8 | |
| 1 13/32 | 7.00 | 14 5/8 | |
| 1 27/64 | 7.50 | 14 3/4 | |
| 1 7/16 | 7.50 | 14 3/4 | |
| 1 29/64 | 8.00 | 14 7/8 | |
| 1 15/32 | 8.00 | 14 7/8 | |
| 1 31/64 | 8.50 | 15 | |
| 1 1/2 | 8.50 | 15 | |
| 1 33/64 | 9.00 | 15 | |
| 1 17/32 | 9.00 | 15 | |
| 1 35/64 | 9.50 | 15 1/4 | |
| 1 9/16 | 9.50 | 15 1/4 | |
| 1 37/64 | 10.00 | 15 1/2 | |
| 1 19/32 | 10.00 | 15 1/2 | |
| 1 39/64 | 10.50 | 15 5/8 | |
| 1 5/8 | 10.50 | 15 5/8 | |
| 1 41/64 | 11.00 | 15 3/4 | |
| 1 21/32 | 11.00 | 15 3/4 | |
| 1 43/64 | 11.50 | 15 3/4 | |
| 1 11/16 | 11.50 | 15 3/4 | |
| 1 45/64 | 12.00 | 15 3/4 | |
| 1 23/32 | 12.00 | 15 3/4 | |
| 1 47/64 | 12.50 | 16 1/4 | |
| 1 3/4 | 12.50 | 16 1/4 | |
| 1 25/32 | 13.25 | 16 1/4 | |

| Diameter Inches | Price Each | Length Overall Inches | Shank Taper |
|---|---|---|---|
| 1 13/16 | $14.00 | 16 1/4 | No. 4 |
| 1 27/32 | 14.75 | 16 1/4 | |
| 1 7/8 | 15.50 | 16 1/2 | |
| 1 29/32 | 16.25 | 16 1/2 | |
| 1 15/16 | 17.00 | 16 5/8 | |
| 1 31/32 | 17.75 | 16 5/8 | |
| 2″ | 18.50 | 16 5/8 | |
| 2 1/32 | 19.25 | 17 3/8 | No. 5 |
| 2 1/16 | 20.00 | 17 3/8 | |
| 2 3/32 | 20.75 | 17 3/8 | |
| 2 1/8 | 21.50 | 17 3/8 | |
| 2 5/32 | 22.25 | 17 3/8 | |
| 2 3/16 | 23.00 | 17 3/8 | |
| 2 7/32 | 23.75 | 17 3/8 | |
| 2 1/4 | 24.50 | 17 3/8 | |
| 2 5/16 | 26.00 | 17 3/8 | |
| 2 3/8 | 27.50 | 17 3/8 | |
| 2 7/16 | 29.00 | 18 3/4 | |
| 2 1/2 | 30.50 | 18 3/4 | |
| 2 9/16 | 32.00 | 19 1/2 | |
| 2 5/8 | 34.00 | 19 1/2 | |
| 2 11/16 | 36.00 | 20 3/8 | |
| 2 3/4 | 38.00 | 20 3/8 | |
| 2 13/16 | 40.50 | 21 1/8 | |
| 2 7/8 | 43.00 | 21 1/8 | |
| 2 15/16 | 45.50 | 21 3/4 | |
| 3″ | 48.00 | 21 3/4 | |
| 3 1/16 | 57.75 | 24 7/16 | No. 6 See Note Below |
| 3 1/8 | 62.25 | 24 7/16 | |
| 3 3/16 | 66.75 | 24 7/16 | |
| 3 1/4 | 72.00 | 25 7/16 | |
| 3 5/16 | 77.50 | 25 7/16 | |
| 3 3/8 | 83.00 | 25 7/16 | |
| 3 7/16 | 88.50 | 25 7/16 | |
| 3 1/2 | 94.00 | 26 7/16 | |

**Sizes larger than 3″ diameter will be furnished with No. 5 Taper Shank at slightly lower list prices (which will be furnished upon application). Overall lengths will be 2 7/16″ shorter than shown above.**

# Straight Shank Drills, Long Set

## Carbon Steel List No. 110

**Code Word—LABORLESS**

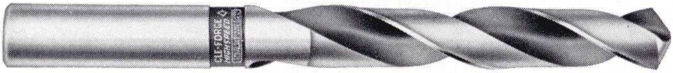
## CLE-FORGE HIGH SPEED DRILLS

TRADE MARK REG. U.S. PAT. OFF.

## Straight Shank, Long Set

## List No. 950

**Code Word—MANAGER**



| Diameter Inches | Price Each |  | Length Overall Inches | Diameter Inches | Price Each |  | Length Overall Inches |
|---|---|---|---|---|---|---|---|
|  | Carbon Steel | High Speed |  |  | Carbon Steel | High Speed |  |
| 1/8 | $ .45 | $1.00 | 5 1/8 | 15/32 | $1.10 | $2.50 | 7 1/2 |
| 9/64 | .45 | 1.10 | 5 3/8 | 31/64 | 1.20 | 2.75 | 7 3/4 |
| 5/32 | .45 | 1.10 | 5 3/8 | 1/2 | 1.20 | 2.75 | 7 3/4 |
| 11/64 | .50 | 1.25 | 5 3/4 | 33/64 | 1.30 | 3.05 | 8 |
| 3/16 | .50 | 1.25 | 5 3/4 | 17/32 | 1.30 | 3.05 | 8 |
| 13/64 | .55 | 1.35 | 6 | 35/64 | 1.40 | 3.50 | 8 1/4 |
| 7/32 | .55 | 1.35 | 6 | 9/16 | 1.40 | 3.50 | 8 1/4 |
| 15/64 | .60 | 1.40 | 6 1/8 | 37/64 | 1.50 | 4.00 | 8 3/4 |
| 1/4 | .60 | 1.40 | 6 1/8 | 19/32 | 1.50 | 4.00 | 8 3/4 |
| 17/64 | .65 | 1.50 | 6 1/4 | 39/64 | 1.60 | 4.25 | 8 3/4 |
| 9/32 | .65 | 1.50 | 6 1/4 | 5/8 | 1.60 | 4.25 | 8 3/4 |
| 19/64 | .70 | 1.60 | 6 3/8 | 41/64 | 1.70 | 4.75 | 9 |
| 5/16 | .70 | 1.60 | 6 3/8 | 21/32 | 1.70 | 4.75 | 9 |
| 21/64 | .75 | 1.70 | 6 1/2 | 43/64 | 1.80 | 5.25 | 9 1/4 |
| 11/32 | .75 | 1.70 | 6 1/2 | 11/16 | 1.80 | 5.25 | 9 1/4 |
| 23/64 | .80 | 1.90 | 6 3/4 | 45/64 | 1.90 | 5.75 | 9 1/2 |
| 3/8 | .80 | 1.90 | 6 3/4 | 23/32 | 1.90 | 5.75 | 9 1/2 |
| 25/64 | .90 | 2.10 | 7 | 47/64 | 2.00 | 6.25 | 9 3/4 |
| 13/32 | .90 | 2.10 | 7 | 3/4 | 2.00 | 6.25 | 9 3/4 |
| 27/64 | 1.00 | 2.30 | 7 1/4 | 49/64 | 2.10 | 6.50 | 9 7/8 |
| 7/16 | 1.00 | 2.30 | 7 1/4 | 25/32 | 2.10 | 6.50 | 9 7/8 |
| 29/64 | 1.10 | 2.50 | 7 1/2 | 51/64 | 2.20 | 6.75 | 10 |

**Continued on next page**

*Always Give List Number When Ordering*

# Straight Shank Drills, Long Set

## Carbon Steel List No. 110

**Code Word—LABORLESS**

## CLE-FORGE HIGH SPEED DRILLS

TRADE MARK REG. U.S. PAT. OFF.

## Straight Shank, Long Set

## List No. 950

**Code Word—MANAGER**

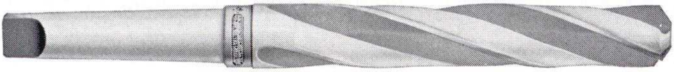
CLE-FORGE
HIGH SPEED

| Diameter Inches | Price Each | | Length Overall Inches |
|---|---|---|---|
| | Carbon Steel | High Speed | |
| $\frac{13}{16}$ | $2.20 | $6.75 | 10 |
| $\frac{53}{64}$ | 2.40 | 7.15 | 10 |
| $\frac{27}{32}$ | 2.40 | 7.15 | 10 |
| $\frac{55}{64}$ | 2.60 | 7.50 | 10 |
| $\frac{7}{8}$ | 2.60 | 7.50 | 10 |
| $\frac{57}{64}$ | 2.80 | 7.85 | 10 |
| $\frac{29}{32}$ | 2.80 | 7.85 | 10 |
| $\frac{59}{64}$ | 3.00 | 8.85 | $10\frac{3}{4}$ |
| $\frac{15}{16}$ | 3.00 | 8.85 | $10\frac{3}{4}$ |
| $\frac{61}{64}$ | 3.25 | 9.65 | 11 |
| $\frac{31}{32}$ | 3.25 | 9.65 | 11 |
| $\frac{63}{64}$ | 3.50 | 10.25 | 11 |
| 1″ | 3.50 | 10.25 | 11 |
| $1\frac{1}{64}$ | 3.75 | 11.00 | $11\frac{1}{8}$ |
| $1\frac{1}{32}$ | 3.75 | 11.00 | $11\frac{1}{8}$ |
| $1\frac{3}{64}$ | 4.00 | 11.75 | $11\frac{1}{4}$ |
| $1\frac{1}{16}$ | 4.00 | 11.75 | $11\frac{1}{4}$ |
| $1\frac{5}{64}$ | 4.25 | 12.20 | $11\frac{1}{2}$ |
| $1\frac{3}{32}$ | 4.25 | 12.20 | $11\frac{1}{2}$ |
| $1\frac{7}{64}$ | 4.50 | 13.15 | $11\frac{3}{4}$ |
| $1\frac{1}{8}$ | 4.50 | 13.15 | $11\frac{3}{4}$ |
| $1\frac{9}{64}$ | 4.75 | 13.85 | $11\frac{7}{8}$ |
| $1\frac{5}{32}$ | 4.75 | 13.85 | $11\frac{7}{8}$ |
| $1\frac{11}{64}$ | $5.00 | $14.55 | 12 |
| $1\frac{3}{16}$ | 5.00 | 14.55 | 12 |
| $1\frac{13}{64}$ | 5.25 | 15.25 | $12\frac{1}{8}$ |
| $1\frac{7}{32}$ | 5.25 | 15.25 | $12\frac{1}{8}$ |
| $1\frac{15}{64}$ | 5.50 | 16.65 | $12\frac{1}{2}$ |
| $1\frac{1}{4}$ | 5.50 | 16.65 | $12\frac{1}{2}$ |
| $1\frac{9}{32}$ | 5.75 | 20.00 | $14\frac{1}{8}$ |
| $1\frac{5}{16}$ | 6.00 | 20.75 | $14\frac{1}{4}$ |
| $1\frac{11}{32}$ | 6.25 | 21.50 | $14\frac{3}{8}$ |
| $1\frac{3}{8}$ | 6.50 | 22.25 | $14\frac{1}{2}$ |
| $1\frac{13}{32}$ | 7.00 | 23.00 | $14\frac{5}{8}$ |
| $1\frac{7}{16}$ | 7.50 | 23.75 | $14\frac{3}{4}$ |
| $1\frac{15}{32}$ | 8.00 | 24.50 | $14\frac{7}{8}$ |
| $1\frac{1}{2}$ | 8.50 | 25.25 | 15 |
| $1\frac{9}{16}$ | 9.50 | 28.20 | $15\frac{1}{4}$ |
| $1\frac{5}{8}$ | 10.50 | 31.25 | $15\frac{5}{8}$ |
| $1\frac{11}{16}$ | 11.50 | 33.55 | $15\frac{3}{4}$ |
| $1\frac{3}{4}$ | 12.50 | 37.00 | $16\frac{1}{4}$ |
| $1\frac{13}{16}$ | 14.00 | 39.40 | $16\frac{1}{4}$ |
| $1\frac{7}{8}$ | 15.50 | 42.75 | $16\frac{1}{2}$ |
| $1\frac{15}{16}$ | 17.00 | 45.45 | $16\frac{5}{8}$ |
| 2″ | 18.50 | 47.85 | $16\frac{5}{8}$ |

*Always Give List Number When Ordering*

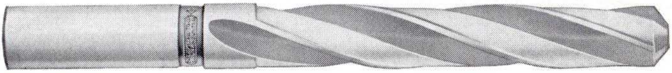
## Three-Fluted Taper Shank Drills

**Carbon Steel No. 12** **High Speed Steel No. 907**
Code Word—LAB Code Word—MACADAM



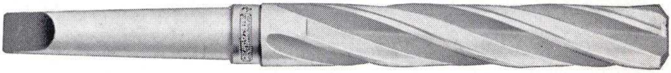
## Three-Fluted Straight Shank Drills

**Carbon Steel No. 24** **High Speed Steel No. 909**
Code Word—LABACIST Code Word—MACE



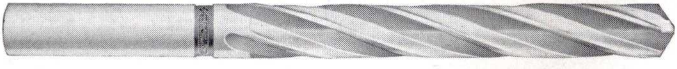
## Four-Fluted Taper Shank Drills

**Carbon Steel No. 21** **High Speed Steel No. 938**
Code Word—LABACING Code Word—MAINTAIN



## Four-Fluted Straight Shank Drills

**Carbon Steel No. 25** **High Speed Steel No. 939**
Code Word—LABACITE Code Word—MAIZE



**The above drills will be found listed on the following three pages**

*Always Give List Number When Ordering*

# Three & Four Fluted High Speed Taper Shank Drills

## Three Fluted List No. 907 Four Fluted List No. 938

**Code Word—MACADAM** **Code Word—MAINTAIN**

**Are especially adapted for enlarging cored, punched or drilled holes. They will not drill the initial hole.**

See Note Below

| | Diameter Inches | Price Each | Length Overall Inches | Shank Taper |
|---|---|---|---|---|
| x | 1/4 | $ 2.75 | 6 1/8 | No. 1 |
| x | 9/32 | 2.85 | 6 1/4 | |
| x | 5/16 | 2.95 | 6 3/8 | |
| x | 11/32 | 3.05 | 6 1/2 | |
| x | 3/8 | 3 25 | 6 3/4 | |
| x | 13/32 | 3 45 | 7 | |
| x | 7/16 | 3.65 | 7 1/4 | |
| x | 15/32 | 3.85 | 7 1/2 | |
| | 1/2 | 4.30 | 8 1/4 | No. 2 |
| | 17/32 | 4.60 | 8 1/2 | |
| | 9/16 | 5.10 | 8 3/4 | |
| | 19/32 | 5.35 | 8 3/4 | |
| | 5/8 | 5.60 | 8 3/4 | |
| | 21/32 | 6.10 | 9 | |
| | 11/16 | 6.60 | 9 1/4 | |
| | 23/32 | 7.10 | 9 1/2 | |
| | 3/4 | 7.60 | 9 3/4 | |
| | 25/32 | 8.00 | 9 7/8 | |
| | 13/16 | 9.00 | 10 3/4 | No. 3 |
| | 27/32 | 9.50 | 10 3/4 | |
| | 7/8 | 10.00 | 10 3/4 | |
| | 29/32 | 10.50 | 10 3/4 | |
| | 15/16 | 11.00 | 10 3/4 | |
| | 31/32 | 12.00 | 11 | |
| | 1″ | 12.75 | 11 | |
| | 1 1/32 | 13.50 | 11 1/8 | |
| | 1 1/16 | 14.25 | 11 1/4 | |
| | 1 3/32 | 15.75 | 12 1/2 | No. 4 |
| | 1 1/8 | 16.75 | 12 3/4 | |
| | 1 5/32 | 17.75 | 12 7/8 | |
| | 1 3/16 | 18.75 | 13 | |
| | 1 7/32 | 19.75 | 13 1/8 | |
| | 1 1/4 | 21.75 | 13 1/2 | |
| | 1 9/32 | 23.75 | 14 1/8 | |
| | 1 5/16 | 24.75 | 14 1/4 | |
| | 1 11/32 | 25.75 | 14 3/8 | |

| Diameter Inches | Price Each | Length Overall Inches | Shank Taper |
|---|---|---|---|
| 1 3/8 | $26.75 | 14 1/2 | No. 4 |
| 1 13/32 | 28.00 | 14 5/8 | |
| 1 7/16 | 29.25 | 14 3/4 | |
| 1 15/32 | 30.50 | 14 7/8 | |
| 1 1/2 | 31.75 | 15 | |
| 1 17/32 | 35.50 | 16 3/8 | No. 5 |
| 1 9/16 | 37.50 | 16 5/8 | |
| 1 19/32 | 39.50 | 16 7/8 | |
| 1 5/8 | 41.00 | 17 | |
| 1 21/32 | 42.50 | 17 1/8 | |
| 1 11/16 | 44.00 | 17 1/8 | |
| 1 23/32 | 45.50 | 17 1/8 | |
| 1 3/4 | 47.00 | 17 1/8 | |
| 1 25/32 | 48.50 | 17 1/8 | |
| 1 13/16 | 50.00 | 17 1/8 | |
| 1 27/32 | 51.50 | 17 1/8 | |
| 1 7/8 | 54 50 | 17 3/8 | |
| 1 29/32 | 56.25 | 17 3/8 | |
| 1 15/16 | 58.00 | 17 3/8 | |
| 1 31/32 | 59.75 | 17 3/8 | |
| 2″ | 61.50 | 17 3/8 | |
| 2 1/32 | 63.25 | 17 3/8 | |
| 2 1/16 | 65.00 | 17 3/8 | |
| 2 1/8 | 68.50 | 17 3/8 | |
| 2 3/16 | 72.00 | 17 3/8 | |
| 2 1/4 | 75.50 | 17 3/8 | |
| 2 5/16 | 79.50 | 17 3/8 | |
| 2 3/8 | 83.50 | 17 3/8 | |
| 2 7/16 | 101.50 | 18 3/4 | |
| 2 1/2 | 105.00 | 18 3/4 | |
| 2 9/16 | 115.50 | 19 1/2 | |
| 2 5/8 | 122.00 | 19 1/2 | |
| 2 11/16 | 135.00 | 20 3/8 | |
| 2 3/4 | 143.00 | 20 3/8 | |
| 2 13/16 | 155.00 | 21 1/8 | |
| 2 7/8 | 163.00 | 21 1/8 | |
| 2 15/16 | 174.00 | 21 3/4 | |
| 3″ | 185.00 | 21 3/4 | |

All sizes not listed are special and subject to special prices.
Sizes marked x are not made in Four Fluted Drill, List No. 938.

***Always Give List Number When Ordering***

# Three & Four Fluted Carbon Taper Shank Drills

## Three Fluted List No. 12 Four Fluted List No. 21

**Code Word—LAB** **Code Word—LABACING**

**Are especially adapted for enlarging cored, punched or drilled holes. They will not drill the initial hole.**

| | Diameter Inches | Price Each | Length Overall Inches | Shank Taper |
|---|---|---|---|---|
| See Note Below | x 1/4 | $1.00 | 6 1/8 | No. 1 |
| | x 9/32 | 1.05 | 6 1/4 | |
| | x 5/16 | 1.10 | 6 3/8 | |
| | x 11/32 | 1.15 | 6 1/2 | |
| | x 3/8 | 1.20 | 6 3/4 | |
| | x 13/32 | 1.25 | 7 | |
| | x 7/16 | 1.30 | 7 1/4 | |
| | x 15/32 | 1.40 | 7 1/2 | |
| | 1/2 | 1.50 | 7 3/4 | |
| | 17/32 | 1.60 | 8 | |
| | 9/16 | 1.70 | 8 1/4 | |
| | 19/32 | 1.80 | 8 3/4 | No. 2 |
| | 5/8 | 1.90 | 8 3/4 | |
| | 21/32 | 2.00 | 9 | |
| | 11/16 | 2.10 | 9 1/4 | |
| | 23/32 | 2.25 | 9 1/2 | |
| | 3/4 | 2.40 | 9 3/4 | |
| | 25/32 | 2.55 | 9 7/8 | |
| | 13/16 | 2.70 | 10 | |
| | 27/32 | 2.85 | 10 | |
| | 7/8 | 3.00 | 10 | |
| | 29/32 | 3.15 | 10 | |
| | 15/16 | 3.30 | 10 3/4 | No. 3 |
| | 31/32 | 3.45 | 11 | |
| | 1" | 3.60 | 11 | |
| | 1 1/32 | 3.75 | 11 1/8 | |
| | 1 1/16 | 4.00 | 11 1/4 | |
| | 1 3/32 | 4.25 | 11 1/2 | |
| | 1 1/8 | 4.50 | 11 3/4 | |
| | 1 5/32 | 4.75 | 11 7/8 | |
| | 1 3/16 | 5.00 | 12 | |
| | 1 7/32 | 5.25 | 12 1/8 | |
| | 1 1/4 | 5.50 | 12 1/2 | |
| | 1 9/32 | 5.75 | 14 1/8 | No. 4 |
| | 1 5/16 | 6.00 | 14 1/4 | |
| | 1 11/32 | 6.25 | 14 3/8 | |

| Diameter Inches | Price Each | Length Overall Inches | Shank Taper |
|---|---|---|---|
| 1 3/8 | $6.50 | 14 1/2 | No. 4 |
| 1 13/32 | 7.00 | 14 5/8 | |
| 1 7/16 | 7.50 | 14 3/4 | |
| 1 15/32 | 8.00 | 14 7/8 | |
| 1 1/2 | 8.50 | 15 | |
| 1 17/32 | 9.00 | 15 | |
| 1 9/16 | 9.50 | 15 1/4 | |
| 1 19/32 | 10.00 | 15 1/2 | |
| 1 5/8 | 10.50 | 15 5/8 | |
| 1 21/32 | 11.00 | 15 3/4 | |
| 1 11/16 | 11.50 | 15 3/4 | |
| 1 23/32 | 12.00 | 15 3/4 | |
| 1 3/4 | 12.50 | 16 1/4 | |
| 1 25/32 | 13.25 | 16 1/4 | |
| 1 13/16 | 14.00 | 16 1/4 | |
| 1 27/32 | 14.75 | 16 1/4 | |
| 1 7/8 | 15.50 | 16 1/2 | |
| 1 29/32 | 16.25 | 16 1/2 | |
| 1 15/16 | 17.00 | 16 5/8 | |
| 1 31/32 | 17.75 | 16 5/8 | |
| 2" | 18.50 | 16 5/8 | |
| 2 1/32 | 19.25 | 17 3/8 | No. 5 |
| 2 1/16 | 20.00 | 17 3/8 | |
| 2 1/8 | 21.50 | 17 3/8 | |
| 2 3/16 | 23.00 | 17 3/8 | |
| 2 1/4 | 24.50 | 17 3/8 | |
| 2 5/16 | 26.00 | 17 3/8 | |
| 2 3/8 | 27.50 | 17 3/8 | |
| 2 7/16 | 29.00 | 18 3/4 | |
| 2 1/2 | 30.50 | 18 3/4 | |
| 2 9/16 | 32.00 | 19 1/2 | |
| 2 5/8 | 34.00 | 19 1/2 | |
| 2 11/16 | 36.00 | 20 3/8 | |
| 2 3/4 | 38.00 | 20 3/8 | |
| 2 13/16 | 40.50 | 21 1/8 | |
| 2 7/8 | 43.00 | 21 1/8 | |
| 2 15/16 | 45.50 | 21 3/4 | |
| 3" | 48.00 | 21 3/4 | |

All sizes not listed are special and subject to special prices.

Sizes marked x are not made in Four Fluted Drill, List No. 21.

***Always Give List Number When Ordering***

# Three & Four Fluted Carbon & High Speed Straight Shank Drills

**3 Fluted Carbon No. 24**
Code Word—LABACIST

**High Speed No. 909**
Code Word—MACE

**4 Fluted Carbon No. 25**
Code Word—LABACITE

**High Speed No. 939**
Code Word—MAIZE

**Are especially adapted for enlarging cored, punched or drilled holes. They will not drill the initial hole.**

See Note Below

| Diameter Inches | Price Each |  | Length Overall Inches | Diameter Inches | Price Each |  | Length Overall Inches |
|---|---|---|---|---|---|---|---|
|  | Carbon Steel | High Speed |  |  | Carbon Steel | High Speed |  |
| x 1/4 | $1.00 | $2.75 | 6 1/8 | 1 1/32 | $3.75 | $13.50 | 11 1/8 |
| x 9/32 | 1.05 | 2.85 | 6 1/4 | 1 1/16 | 4.00 | 14.25 | 11 1/4 |
| x 5/16 | 1.10 | 2.95 | 6 3/8 | 1 3/32 | 4.25 | 14.50 | 11 1/2 |
| x 11/32 | 1.15 | 3.05 | 6 1/2 | 1 1/8 | 4.50 | 15.45 | 11 3/4 |
| x 3/8 | 1.20 | 3.25 | 6 3/4 | 1 5/32 | 4.75 | 16.40 | 11 7/8 |
| x 13/32 | 1.25 | 3.45 | 7 | 1 3/16 | 5.00 | 17.30 | 12 |
| x 7/16 | 1.30 | 3.65 | 7 1/4 | 1 7/32 | 5.25 | 18.25 | 12 1/8 |
| x 15/32 | 1.40 | 3.85 | 7 1/2 | 1 1/4 | 5.50 | 20.15 | 12 1/2 |
| 1/2 | 1.50 | 4.05 | 7 3/4 | 1 9/32 | 5.75 | 23.75 | 14 1/8 |
| 17/32 | 1.60 | 4.35 | 8 | 1 5/16 | 6.00 | 24.75 | 14 1/4 |
| 9/16 | 1.70 | 4.80 | 8 1/4 | 1 11/32 | 6.25 | 25.75 | 14 3/8 |
| 19/32 | 1.80 | 5.35 | 8 3/4 | 1 3/8 | 6.50 | 26.75 | 14 1/2 |
| 5/8 | 1.90 | 5.60 | 8 3/4 | 1 13/32 | 7.00 | 28.00 | 14 5/8 |
| 21/32 | 2.00 | 6.10 | 9 | 1 7/16 | 7.50 | 29.25 | 14 3/4 |
| 11/16 | 2.10 | 6.60 | 9 1/4 | 1 15/32 | 8.00 | 30.50 | 14 7/8 |
| 23/32 | 2.25 | 7.10 | 9 1/2 | 1 1/2 | 8.50 | 31.75 | 15 |
| 3/4 | 2.40 | 7.60 | 9 3/4 | 1 9/16 | 9.50 | 34.40 | 15 1/4 |
| 25/32 | 2.55 | 8.00 | 9 7/8 | 1 5/8 | 10.50 | 37.70 | 15 5/8 |
| 13/16 | 2.70 | 8.35 | 10 | 1 11/16 | 11.50 | 40.45 | 15 3/4 |
| 27/32 | 2.85 | 8.85 | 10 | 1 3/4 | 12.50 | 44.60 | 16 1/4 |
| 7/8 | 3.00 | 9.30 | 10 | 1 13/16 | 14.00 | 47.45 | 16 1/4 |
| 29/32 | 3.15 | 9.75 | 10 | 1 7/8 | 15.50 | 51.75 | 16 1/2 |
| 15/16 | 3.30 | 11.00 | 10 3/4 |  |  |  |  |
| 31/32 | 3.45 | 12.00 | 11 | 1 15/16 | 17.00 | 55.50 | 16 5/8 |
| 1″ | 3.60 | 12.75 | 11 | 2″ | 18.50 | 58.85 | 16 5/8 |

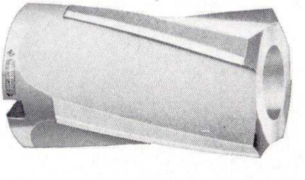
All sizes not listed are special and subject to special prices.
Sizes marked x are not made in Four Fluted Drills, Lists Nos. 25 and 939.

***Always Give List Number When Ordering***

# High Speed Shell Drills

## List No. 946

Code Word—MALT



| Diameter Inches | Price Each | Length Overall Inches | Size Hole Inches | Fitting Arbor | Diameter Inches | Price Each | Length Overall Inches | Size Hole Inches | Fitting Arbor |
|---|---|---|---|---|---|---|---|---|---|
| $1\frac{11}{16}$ | \$9.75 | $3\frac{1}{2}$ | 1 | No. 8 | $2\frac{3}{8}$ | \$18.00 | $3\frac{3}{4}$ | $1\frac{1}{4}$ | No. 9 |
| $1\frac{3}{4}$ | 10.50 | $3\frac{1}{2}$ | 1 |  | $2\frac{7}{16}$ | 18.75 | $3\frac{3}{4}$ | $1\frac{1}{4}$ |  |
| $1\frac{13}{16}$ | 11.25 | $3\frac{1}{2}$ | 1 |  | $2\frac{1}{2}$ | 19.50 | $3\frac{3}{4}$ | $1\frac{1}{4}$ |  |
| $1\frac{7}{8}$ | 12.00 | $3\frac{1}{2}$ | 1 |  | $2\frac{9}{16}$ | 20.50 | 4 | $1\frac{1}{2}$ | No. 10 |
| $1\frac{15}{16}$ | 12.75 | $3\frac{1}{2}$ | 1 |  | $2\frac{5}{8}$ | 21.75 | 4 | $1\frac{1}{2}$ |  |
| 2″ | 13.50 | $3\frac{1}{2}$ | 1 |  | $2\frac{11}{16}$ | 23.00 | 4 | $1\frac{1}{2}$ |  |
| $2\frac{1}{16}$ | 14.25 | $3\frac{3}{4}$ | $1\frac{1}{4}$ | No. 9 | $2\frac{3}{4}$ | 24.25 | 4 | $1\frac{1}{2}$ |  |
| $2\frac{1}{8}$ | 15.00 | $3\frac{3}{4}$ | $1\frac{1}{4}$ |  | $2\frac{13}{16}$ | 25.50 | 4 | $1\frac{1}{2}$ |  |
| $2\frac{3}{16}$ | 15.75 | $3\frac{3}{4}$ | $1\frac{1}{4}$ |  | $2\frac{7}{8}$ | 27.00 | 4 | $1\frac{1}{2}$ |  |
| $2\frac{1}{4}$ | 16.50 | $3\frac{3}{4}$ | $1\frac{1}{4}$ |  | $2\frac{15}{16}$ | 28.50 | 4 | $1\frac{1}{2}$ |  |
| $2\frac{5}{16}$ | 17.25 | $3\frac{3}{4}$ | $1\frac{1}{4}$ |  | 3″ | 30.00 | 4 | $1\frac{1}{2}$ |  |

All Shell Drills listed above have 4 flutes.

These Drills take the same Arbors as regular Shell Reamers.

Shell Drills have taper holes, the diameters given being at the large end.

For Arbors see pages 80 and 81.

*Always Give List Number When Ordering*

# Straight Shank Drills, Short Set

## Carbon Steel List No. 108

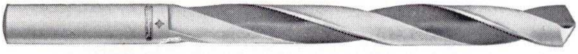
Code Word—LABIUM

**CLE-FORGE HIGH SPEED DRILLS**

TRADE MARK REG. U. S. PAT. OFF.

## List No. 917

Code Word—MACKEREL



| Diameter Inches | Price per Dozen | | Length Overall Inches | Diameter Inches | Price per Dozen | | Length Overall Inches |
|---|---|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | Carbon Steel | High Speed | |
| 1/64 | $1.50 | $4.25 | ⅞ | 17/64 | $3.50 | $7.50 | 4⅛ |
| 1/32 | 1.50 | 3.50 | 1½ | 9/32 | 3.80 | 8.25 | 4¼ |
| 3/64 | 1.55 | 2.40 | 1¾ | 19/64 | 4.00 | 9.00 | 4⅜ |
| 1/16 | 1.60 | 3.00 | 2½ | 5/16 | 4.35 | 9.75 | 4½ |
| 5/64 | 1.65 | 3.10 | 2⅝ | 21/64 | 4.70 | 10.75 | 4⅝ |
| 3/32 | 1.70 | 3.20 | 2¾ | 11/32 | 5.05 | 11.75 | 4¾ |
| 7/64 | 1.75 | 3.40 | 2⅞ | 23/64 | 5.50 | 12.75 | 4⅞ |
| ⅛ | 1.80 | 3.60 | 3 | ⅜ | 6.00 | 13.75 | 5 |
| 9/64 | 1.85 | 3.90 | 3⅛ | 25/64 | 6.50 | 15.00 | 5⅛ |
| 5/32 | 1.90 | 4.20 | 3¼ | 13/32 | 7.00 | 16.25 | 5¼ |
| 11/64 | 2.00 | 4.50 | 3⅜ | 27/64 | 7.75 | 17.50 | 5⅜ |
| 3/16 | 2.25 | 4.85 | 3½ | 7/16 | 8.50 | 18.75 | 5½ |
| 13/64 | 2.50 | 5.25 | 3⅝ | 29/64 | 9.25 | 20.00 | 5⅝ |
| 7/32 | 2.75 | 5.75 | 3¾ | 15/32 | 10.00 | 21.25 | 5¾ |
| 15/64 | 3.00 | 6.25 | 3⅞ | 31/64 | 11.00 | 22.75 | 5⅞ |
| ¼ | 3.25 | 6.75 | 4 | ½ | 12.00 | 24.25 | 6 |

**Carbon drills for use in brass are carried in stock and take above list prices of No.108. For description and List Number, see page 31**

***Always Give List Number When Ordering***

# Straight Shank Drills, Wire Gauge

## Carbon Steel No. 108A

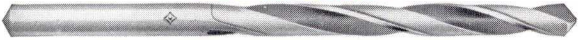
Code Word—LABOR

**CLE-FORGE HIGH SPEED DRILLS**

TRADE MARK REG. U. S. PAT. OFF.

## List No. 918

Code Word—MADAM



| Wire Gauge No. | Price per Dozen Carbon Steel | Price per Dozen High Speed | Decimal Diameter Inches | Length Over-all Inches | Wire Gauge No. | Price per Dozen Carbon Steel | Price per Dozen High Speed | Decimal Diameter Inches | Length Over-all Inches |
|---|---|---|---|---|---|---|---|---|---|
| 1 | $2.75 | $6.45 | .2280 | 4 | 31 | $1.75 | $3.30 | .1200 | 2 3/4 |
| 2 | 2.75 | 6.45 | .2210 | 3 15/16 | 32 | 1.75 | 3.30 | .1160 | 2 11/16 |
| 3 | 2.75 | 6.15 | .2130 | 3 15/16 | 33 | 1.75 | 3.30 | .1130 | 2 11/16 |
| 4 | 2.75 | 5.95 | .2090 | 3 7/8 | 34 | 1.75 | 3.15 | .1110 | 2 5/8 |
| 5 | 2.75 | 5.95 | .2055 | 3 13/16 | 35 | 1.75 | 3.15 | .1100 | 2 9/16 |
| 6 | 2.50 | 5.95 | .2040 | 3 13/16 | 36 | 1.75 | 3.10 | .1065 | 2 9/16 |
| 7 | 2.50 | 5.45 | .2010 | 3 3/4 | 37 | 1.75 | 2.95 | .1040 | 2 1/2 |
| 8 | 2.50 | 5.45 | .1990 | 3 11/16 | 38 | 1.75 | 2.95 | .1015 | 2 7/16 |
| 9 | 2.50 | 5.45 | .1960 | 3 11/16 | 39 | 1.75 | 2.95 | .0995 | 2 7/16 |
| 10 | 2.50 | 5.25 | .1935 | 3 5/8 | 40 | 1.75 | 2.80 | .0980 | 2 3/8 |
| 11 | 2.25 | 5.25 | .1910 | 3 9/16 | 41 | 1.70 | 2.80 | .0960 | 2 5/16 |
| 12 | 2.25 | 5.25 | .1890 | 3 9/16 | 42 | 1.70 | 2.75 | .0935 | 2 5/16 |
| 13 | 2.25 | 4.85 | .1850 | 3 1/2 | 43 | 1.70 | 2.60 | .0890 | 2 1/4 |
| 14 | 2.25 | 4.85 | .1820 | 3 7/16 | 44 | 1.70 | 2.60 | .0860 | 2 3/16 |
| 15 | 2.25 | 4.85 | .1800 | 3 7/16 | 45 | 1.70 | 2.60 | .0820 | 2 3/16 |
| 16 | 2.00 | 4.65 | .1770 | 3 3/8 | 46 | 1.65 | 2.50 | .0810 | 2 1/8 |
| 17 | 2.00 | 4.65 | .1730 | 3 5/16 | 47 | 1.65 | 2.50 | .0785 | 2 1/16 |
| 18 | 2.00 | 4.50 | .1695 | 3 5/16 | 48 | 1.65 | 2.50 | .0760 | 2 1/16 |
| 19 | 2.00 | 4.35 | .1660 | 3 1/4 | 49 | 1.65 | 2.50 | .0730 | 2 |
| 20 | 2.00 | 4.35 | .1610 | 3 3/16 | 50 | 1.65 | 2.40 | .0700 | 1 15/16 |
| 21 | 1.90 | 4.35 | .1590 | 3 3/16 | 51 | 1.60 | 2.40 | .0670 | 1 15/16 |
| 22 | 1.90 | 4.15 | .1570 | 3 1/8 | 52 | 1.60 | 2.40 | .0635 | 1 7/8 |
| 23 | 1.90 | 4.05 | .1540 | 3 1/16 | 53 | 1.60 | 2.40 | .0595 | 1 13/16 |
| 24 | 1.90 | 4.05 | .1520 | 3 1/16 | 54 | 1.60 | 2.40 | .0550 | 1 13/16 |
| 25 | 1.90 | 3.90 | .1495 | 3 | 55 | 1.60 | 2.40 | .0520 | 1 3/4 |
| 26 | 1.80 | 3.90 | .1470 | 2 15/16 | 56 | 1.55 | 2.40 | .0465 | 1 11/16 |
| 27 | 1.80 | 3.90 | .1440 | 2 15/16 | 57 | 1.55 | 2.40 | .0430 | 1 11/16 |
| 28 | 1.80 | 3.60 | .1405 | 2 7/8 | 58 | 1.55 | 2.40 | .0420 | 1 5/8 |
| 29 | 1.80 | 3.60 | .1360 | 2 13/16 | 59 | 1.55 | 2.40 | .0410 | 1 9/16 |
| 30 | 1.80 | 3.60 | .1285 | 2 13/16 | 60 | 1.55 | 2.40 | .0400 | 1 9/16 |

**Carbon Drills for use in brass are carried in stock and take above list prices of No. 108A. For description and List Number, see page 31.**

***Always Give List Number When Ordering***

## Straight Shank Drills, Wire Gauge

**Carbon Steel No. 108A** Code Word—LABOR

**High Speed Steel No. 918** Code Word—MADAM

| Wire Gauge No. | Price per Dozen |  | Decimal Diameter Inches | Length Overall Inches | Wire Gauge No. | Price per Dozen |  | Decimal Diameter Inches | Length Overall Inches |
|---|---|---|---|---|---|---|---|---|---|
|  | Carbon Steel | High Speed |  |  |  | Carbon Steel | High Speed |  |  |
| 61 | $1.50 | $3.50 | .0390 | 1 1/2 | 71 | $1.50 | $4.25 | .0260 | 1 5/16 |
| 62 | 1.50 | 3.50 | .0380 | 1 1/2 | 72 | 1.50 | 4.25 | .0250 | 1 1/4 |
| 63 | 1.50 | 3.50 | .0370 | 1 1/2 | 73 | 1.50 | 4.25 | .0240 | 1 3/16 |
| 64 | 1.50 | 3.50 | .0360 | 1 1/2 | 74 | 1.50 | 4.25 | .0225 | 1 1/8 |
| 65 | 1.50 | 3.50 | .0350 | 1 1/2 | 75 | 1.50 | 4.25 | .0210 | 1 1/16 |
| 66 | 1.50 | 3.50 | .0330 | 1 1/2 | 76 | 1.50 | 4.25 | .0200 | 1 |
| 67 | 1.50 | 3.50 | .0320 | 1 7/16 | 77 | 1.50 | 4.25 | .0180 | 15/16 |
| 68 | 1.50 | 3.50 | .0310 | 1 7/16 | 78 | 1.50 | 4.25 | .0160 | 7/8 |
| 69 | 1.50 | 3.50 | .0292 | 1 3/8 | 79 | 1.50 | 4.25 | .0145 | 13/16 |
| 70 | 1.50 | 3.50 | .0280 | 1 5/16 | 80 | 1.50 | 4.25 | .0135 | 3/4 |

**Carbon drills for use in brass are carried in stock and take above list prices of No. 108A. For description and List Number, see page 31.**

## Straight Shank Drills, Letter Size

**Carbon Steel No. 109** Code Word—LABORING

**CLE-FORGE HIGH SPEED DRILLS**

TRADE MARK REG. U. S. PAT. OFF.

**List No. 919** Code Word—MADCAP

| Diameter | Price per Dozen |  | Decimal Diameter Inches | Length Overall Inches | Diameter | Price per Dozen |  | Decimal Diameter Inches | Length Overall Inches |
|---|---|---|---|---|---|---|---|---|---|
|  | Carbon Steel | High Speed |  |  |  | Carbon Steel | High Speed |  |  |
| A | $3.00 | $6.25 | .234 | 3 7/8 | N | $4.25 | $ 9.50 | .302 | 4 3/8 |
| B | 3.05 | 6.55 | .238 | 3 7/8 | O | 4.40 | 10.45 | .316 | 4 1/2 |
| C | 3.10 | 6.55 | .242 | 3 7/8 | P | 4.60 | 10.75 | .323 | 4 5/8 |
| D | 3.15 | 6.75 | .246 | 4 | Q | 4.75 | 11.75 | .332 | 4 3/4 |
| E | 3.25 | 6.75 | .250 | 4 | R | 5.05 | 11.75 | .339 | 4 3/4 |
| F | 3.35 | 7.50 | .257 | 4 1/8 | S | 5.15 | 12.75 | .348 | 4 7/8 |
| G | 3.45 | 7.50 | .261 | 4 1/8 | T | 5.50 | 12.75 | .358 | 4 7/8 |
| H | 3.50 | 8.00 | .266 | 4 1/8 | U | 6.00 | 13.75 | .368 | 5 |
| I | 3.65 | 8.00 | .272 | 4 1/8 | V | 6.00 | 14.65 | .377 | 5 |
| J | 3.70 | 8.00 | .277 | 4 1/8 | W | 6.50 | 15.00 | .386 | 5 1/8 |
| K | 3.80 | 8.25 | .281 | 4 1/4 | X | 6.75 | 15.85 | .397 | 5 1/8 |
| L | 3.90 | 8.75 | .290 | 4 1/4 | Y | 7.00 | 15.85 | .404 | 5 1/4 |
| M | 4.00 | 9.00 | .295 | 4 3/8 | Z | 7.25 | 17.10 | .413 | 5 1/4 |

## "Bakelite" Type Drills

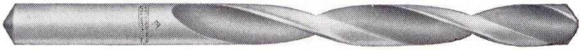
(Regular Short Set Length)

### High Speed Steel Fraction Sizes List No. 924

Code Word—MAGICIAN

### High Speed Steel Wire Gauge Sizes List No. 925

Code Word—MAGISTRATE



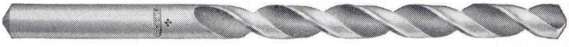
This drill has been developed for use in bakelite, fibre, hard rubber, and resinous materials of a similar type. It is made regularly only of high speed steel, as this has been found more able to resist the abrasive qualities of these materials.

**Prices same as List Nos. 917 and 918 on pages 27, 28 and 29.**

## "Hy-Spiral" Type Drills

(Regular Short Set Length)

| Carbon Steel | High Speed Steel |
|---|---|
| List No. 1308 | List No. 957 |
| Code Word—NAP | Code Word—MANGO |



This type of drill was developed for the drilling of slate, marble, and especially for the drilling of deeper holes in materials of low tensile strength, such as aluminum, magnesium, die casting metal, wood, copper, fibre, and some of the molded composition materials.

In ordering, the material in which the drill is to be used should be specified.

The high speed drill is recommended, unless the material is quite soft and easily machineable.

This same type of drill can be specially made with a heavier cross-section and has, on jobs of a particular type, proven very satisfactory for use in drilling deeper holes in ordinary commercial steels.

**Carbon Steel Prices upon application. High Speed Steel Prices same as List Nos. 917 or 918 on pages 27, 28 and 29.**

*Always Give List Number When Ordering*

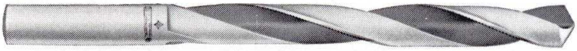
# Drills for Brass

(Regular Short Set Length)

## Carbon Steel Fraction Sizes

## List No. 1208

**Code Word—MOANING**



## Carbon Steel Wire Gauge Sizes

## List No. 1207

**Code Word—MOAN**

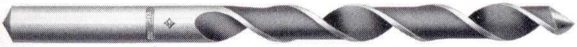
These drills have been designed primarily for use in brass and should prove superior to regular carbon drills. They also have proved satisfactory for drilling holes of ordinary depths in magnesium alloys.

**Prices same as List Nos. 108 and 108A on pages 27, 28 and 29.**

# Bobbin Bit

(Single Fluted Drill)

| Carbon Steel | High Speed Steel |
|---|---|
| List No. 123 | List No. 958 |
| Code Word—LAFTY | Code Word—MANGREW |

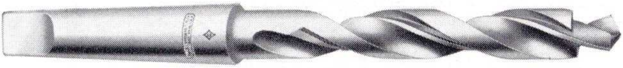


This type of drill was originally developed for the drilling of deep holes in wood. Due to its chip clearing ability, it has been found very satisfactory for the drilling of celluloid, the chips of which will stick in the flutes of an ordinary twist drill.

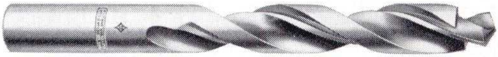
This drill is **not** recommended for use in materials of much higher tensile strength than wood or celluloid. **Prices upon application.**

*Always Give List Number When Ordering*

# Dual Cut Drills



Taper Shank Drill



Straight Shank Drill

"Cleveland" Dual Cut Drills are designed for drilling and counterboring, or drilling and chamfering, in the same operation.

They are an improvement over the ordinary type of combination, or two-step drill, in that the lands of the small diameter already are ground to size for the full length of the flutes. When dull, the cutting lips of the large diameter may be resharpened without touching the lands of the small diameter and, consequently, without reducing the size of the small diameter.

Dual Cut Drills can be furnished with any style shank.

**These drills are special and subject to special prices. Prices will be furnished upon application.**

# Drills for Blacksmiths' Drill Presses

## ½-Inch Shank, Short Set

## Carbon Steel No. 120

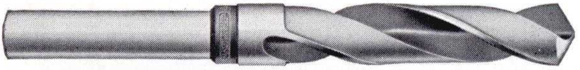
**Code Word—LADRONE**

## CLE-FORGE HIGH SPEED DRILLS

TRADE MARK REG. U. S. PAT. OFF.

## List No. 936

**Code Word—MAINMAST**



**Shanks ½-inch diameter and 2¼ inches long**

| Diameter Inches | Price Each | | Length Overall Inches | Diameter Inches | Price Each | | Length Overall Inches |
|---|---|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | Carbon Steel | High Speed | |
| ⅛ | $ .45 | $1.40 | 4⅞ | 23/32 | $1.60 | $5.25 | 6 |
| 5/32 | .45 | 1.50 | 5⅛ | ¾ | 1.70 | 5.50 | 6 |
| 3/16 | .50 | 1.60 | 5½ | 25/32 | 1.80 | 5.75 | 6 |
| 7/32 | .55 | 1.75 | 5¾ | 13/16 | 1.90 | 6.00 | 6 |
| ¼ | .60 | 1.90 | 6 | 27/32 | 2.00 | 6.25 | 6 |
| 9/32 | .65 | 2.05 | 6 | ⅞ | 2.10 | 6.50 | 6 |
| 5/16 | .70 | 2.20 | 6 | 29/32 | 2.20 | 6.75 | 6 |
| 11/32 | .75 | 2.35 | 6 | 15/16 | 2.30 | 7.25 | 6 |
| ⅜ | .80 | 2.50 | 6 | 31/32 | 2.40 | 7.75 | 6 |
| 13/32 | .85 | 2.75 | 6 | 1 | 2.50 | 8.50 | 6 |
| 7/16 | .90 | 3.00 | 6 | 1 1/32 | 2.60 | .... | 6 |
| 15/32 | .95 | 3.25 | 6 | 1 1/16 | 2.70 | .... | 6 |
| ½ | 1.00 | 3.50 | 6 | 1⅛ | 2.90 | .... | 6 |
| 17/32 | 1.05 | 3.75 | 6 | 1 3/16 | 3.10 | .... | 6 |
| 9/16 | 1.10 | 4.00 | 6 | 1¼ | 3.30 | .... | 6 |
| 19/32 | 1.20 | 4.25 | 6 | 1 5/16 | 3.60 | .... | 6 |
| ⅝ | 1.30 | 4.50 | 6 | 1⅜ | 3.90 | .... | 6 |
| 21/32 | 1.40 | 4.75 | 6 | 1 7/16 | 4.20 | .... | 6 |
| 11/16 | 1.50 | 5.00 | 6 | 1½ | 4.50 | .... | 6 |

High Speed Drills with ½-inch shanks will be furnished in sizes over ¾-inch diameter only at customer's risk, as we do not consider the shanks strong enough.

List No. 120 only is regularly furnished with flatted shank. It will be furnished with round shanks only when so ordered. List No. 936 has round shanks in all sizes.

For use in portable electric drills, we recommend that in all sizes up to and including ½-inch Straight Shank High Speed Drill No. 917 be used. (This is listed on page 27).

# Drills for Blacksmiths' Drill Presses

## Coe Shank (.648″ Diameter)

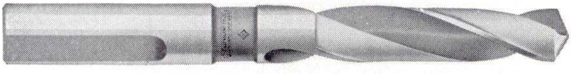
## Carbon Steel No. 116

**Code Word—LADDER**

**CLE-FORGE HIGH SPEED DRILLS**
TRADE MARK REG. U. S. PAT. OFF.

## List No. 931

**Code Word—MAILCLAD**



**Shanks are .648-in. diameter (commonly called 5/8-in.) and 2 1/4 in. long**

| Diameter Inches | Price Each | | Length Overall Inches | Diameter Inches | Price Each | | Length Overall Inches |
|---|---|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | Carbon Steel | High Speed | |
| 1/8 | $ .50 | .... | 4 7/8 | 23/32 | $1.60 | $5.25 | 6 |
| 5/32 | .55 | .... | 5 1/8 | 3/4 | 1.70 | 5.50 | 6 |
| 3/16 | .60 | .... | 5 1/2 | 25/32 | 1.80 | 5.75 | 6 |
| 7/32 | .65 | .... | 5 3/4 | 13/16 | 1.90 | 6.00 | 6 |
| 1/4 | .70 | .... | 6 | 27/32 | 2.00 | 6.25 | 6 |
| 9/32 | .75 | .... | 6 | 7/8 | 2.10 | 6.50 | 6 |
| 5/16 | .80 | .... | 6 | 29/32 | 2.20 | 6.75 | 6 |
| 11/32 | .85 | .... | 6 | 15/16 | 2.30 | 7.25 | 6 |
| 3/8 | .90 | .... | 6 | 31/32 | 2.40 | 7.75 | 6 |
| 13/32 | .95 | .... | 6 | 1 | 2.50 | 8.50 | 6 |
| 7/16 | 1.00 | .... | 6 | 1 1/32 | 2.60 | 9.25 | 6 |
| 15/32 | 1.05 | .... | 6 | 1 1/16 | 2.70 | 10.00 | 6 |
| 1/2 | 1.10 | $3.50 | 6 | 1 1/8 | 2.90 | 11.25 | 6 |
| 17/32 | 1.15 | 3.75 | 6 | 1 3/16 | 3.10 | 12.50 | 6 |
| 9/16 | 1.20 | 4.00 | 6 | 1 1/4 | 3.30 | 13.75 | 6 |
| 19/32 | 1.25 | 4.25 | 6 | 1 5/16 | 3.60 | .... | 6 |
| 5/8 | 1.30 | 4.50 | 6 | 1 3/8 | 3.90 | .... | 6 |
| 21/32 | 1.40 | 4.75 | 6 | 1 7/16 | 4.20 | .... | 6 |
| 11/16 | 1.50 | 5.00 | 6 | 1 1/2 | 4.50 | .... | 6 |

High-Speed Drills with 5/8-inch shank will be furnished in sizes over 3/4-inch diameter only at customer's risk, as we do not consider the shanks strong enough.

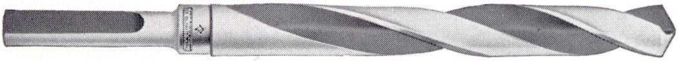
***Always Give List Number When Ordering***

# Drills for Blacksmiths' Drill Presses

## ½-Inch Shank, Long Set

## Carbon Steel No. 118

**Code Word—LADLE**



**Shanks ½ inch Diameter and 2½ inches long**

| Diameter Inches | Price Each | Length Overall Inches | Diameter Inches | Price Each | Length Overall Inches |
|---|---|---|---|---|---|
| 3/8 | $ .80 | 6¾ | 23/32 | $1.90 | 9½ |
| 13/32 | .90 | 7 | ¾ | 2.00 | 9¾ |
| 7/16 | 1.00 | 7¼ | 25/32 | 2.10 | 9⅞ |
| 15/32 | 1.10 | 7½ | 13/16 | 2.20 | 10 |
| ½ | 1.20 | 7¾ | 27/32 | 2.40 | 10¼ |
| 17/32 | 1.30 | 8 | ⅞ | 2.60 | 10½ |
| 9/16 | 1.40 | 8¼ | 29/32 | 2.80 | 10⅝ |
| 19/32 | 1.50 | 8½ | 15/16 | 3.00 | 10¾ |
| ⅝ | 1.60 | 8¾ | 31/32 | 3.25 | 10⅞ |
| 21/32 | 1.70 | 9 | 1″ | 3.50 | 11 |
| 11/16 | 1.80 | 9¼ | | | |

*Always Give List Number When Ordering*

# Square Shank Ratchet Drills

## Carbon Steel List No. 111

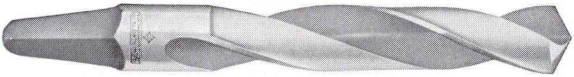
**Code Word—LABRAX—for No. 1 Shank**
**Code Word—LABRUM—for No. 2 Shank**

## CLE-FORGE HIGH SPEED DRILLS

TRADE MARK REG. U. S. PAT. OFF.

## List No. 914

**Code Word—MACHAM—for No. 1 Shank**
**Code Word—MACHO—for No. 2 Shank**



| Diameter Inches | Price Each | | Length Overall Inches |
|---|---|---|---|
| | Carbon Steel | High Speed | |
| ⅛ | $ .90 | ..... | 4½ |
| 5/32 | .95 | ..... | 4⅝ |
| 3/16 | .95 | ..... | 4⅞ |
| 7/32 | 1.00 | ..... | 5 |
| ¼ | 1.00 | ..... | 5 |
| 9/32 | 1.05 | ..... | 5 |
| 5/16 | 1.10 | ..... | 5 |
| 11/32 | 1.15 | ..... | 5 |
| ⅜ | 1.20 | ..... | 6 |
| 13/32 | 1.25 | ..... | 6¼ |
| 7/16 | 1.25 | ..... | 6¼ |
| 15/32 | 1.30 | ..... | 6¼ |
| ½ | 1.30 | $2.90 | 6½ |
| 17/32 | 1.35 | 2.95 | 6½ |
| 9/16 | 1.35 | 3.00 | 6½ |
| 19/32 | 1.40 | 3.10 | 6½ |
| ⅝ | 1.40 | 3.20 | 6½ |
| 21/32 | 1.45 | 3.30 | 6½ |
| 11/16 | 1.45 | 3.40 | 6½ |
| 23/32 | 1.50 | 3.50 | 6½ |
| ¾ | 1.55 | 3.65 | 6½ |
| 25/32 | 1.65 | 3.80 | 6¾ |
| 13/16 | $1.75 | $4.00 | 7 |
| 27/32 | 1.90 | 4.20 | 7¼ |
| ⅞ | 2.05 | 4.50 | 7½ |
| 29/32 | 2.20 | 4.70 | 7¾ |
| 15/16 | 2.30 | 5.00 | 8 |
| 31/32 | 2.40 | 5.25 | 8¼ |
| 1″ | 2.55 | 5.50 | 8½ |
| 1 1/32 | 2.70 | 5.75 | 8¾ |
| 1 1/16 | 2.85 | 6.00 | 9 |
| 1 3/32 | 3.00 | 6.30 | 9 |
| 1⅛ | 3.10 | 6.70 | 9 |
| 1 5/32 | 3.25 | 7.00 | 9 |
| 1 3/16 | 3.35 | 7.30 | 9 |
| 1 7/32 | 3.50 | 7.60 | 9 |
| 1¼ | 3.65 | 7.90 | 9 |
| 1 9/32 | 3.75 | 8.25 | 9 |
| 1 5/16 | 3.90 | 8.60 | 9 |
| 1 11/32 | 4.05 | 9.00 | 9 |
| 1⅜ | 4.20 | 9.40 | 9 |
| 1 13/32 | 4.35 | 9.80 | 9 |
| 1 7/16 | 4.50 | 10.20 | 9 |
| 1 15/32 | 4.65 | 10.60 | 9 |
| 1½ | 4.80 | 11.00 | 9 |

No 1 Shanks—⅜ inch by ⅝ inch by 1½ inches long. No. 2 Shanks—½ inch by ¾ inch by 1¾ inches long.

**Unless otherwise specified No. 2 Shank will be furnished.**

To avoid mistakes in ordering specify number, or dimensions, of shank.

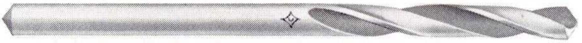
Sizes and dimensions not listed are special and take special prices.

*Always Give List Number When Ordering*

# Tell-Tale Drills

**Carbon Steel No. 112**
Code Word—LACES

**High Speed Steel No. 952**
Code Word—MANDOLIN



**For Drilling Tell-Tale Holes in Stay-Bolts**

| Diameter Inches | Price per Dozen | | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|---|
| | Carbon Steel | High Speed | | |
| 3/16 | $2.25 | $4.85 | 1¾ | 3½ |
| 7/32 | 2.75 | 5.75 | 1¾ | 3¾ |

## Long Set

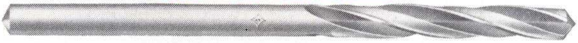
**Carbon Steel No. 112A**
Code Word—LACIB

**High Speed Steel No. 951**
Code Word—MANDATE

| Diameter Inches | Price Each | | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|---|
| | Carbon Steel | High Speed | | |
| 3/16 | $ .50 | $1.25 | 3½ | 5½ |
| 7/32 | .55 | 1.35 | 3½ | 5½ |

## Three Fluted

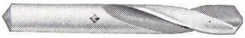
**Cle-Forge High Speed Steel No. 953**
Code Word—MANDRAKE



| Diameter Inches | Price per Dozen | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|
| 3/16 | $6.50 | 1¾ | 3½ |
| 7/32 | 7.75 | 1¾ | 3¾ |

## Center Drills—List No. 125

Code Word—LAGERS



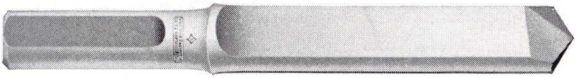
| Diameter Inches | Price per Dozen | Length Overall Inches | Diameter Inches | Price per Dozen | Length Overall Inches |
|---|---|---|---|---|---|
| 1/16 | $1.60 | 1¼ | 11/64 | $2.00 | 1½ |
| 5/64 | 1.65 | 1¼ | 3/16 | 2.25 | 1½ |
| 3/32 | 1.70 | 1¼ | 13/64 | 2.50 | 1½ |
| 7/64 | 1.75 | 1¼ | 7/32 | 2.75 | 1½ |
| 1/8 | 1.80 | 1¼ | 15/64 | 3.00 | 1½ |
| 9/64 | 1.85 | 1¼ | 1/4 | 3.25 | 1½ |
| 5/32 | 1.90 | 1½ | 17/64 | 3.50 | 1½ |

*Always Give List Number When Ordering*

# High Speed Flat Track Drills

## List No. 948

**Code Word—MAMMON**



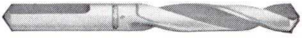
**Shanks are 2¼ inches long and .648 inch diameter, commonly called ⅝ inch**

| Diameter Inches | Price Each | Length Overall Inches | Diameter Inches | Price Each | Length Overall Inches |
|---|---|---|---|---|---|
| ½ | $ .95 | 6¼ | 1 1/16 | $1.65 | 6¼ |
| 9/16 | 1.00 | 6¼ | 1⅛ | 1.75 | 6¼ |
| ⅝ | 1.05 | 6¼ | 1 3/16 | 1.85 | 6¼ |
| 11/16 | 1.10 | 6¼ | 1¼ | 1.95 | 6¼ |
| ¾ | 1.20 | 6¼ | 1 5/16 | 2.20 | 6¼ |
| 13/16 | 1.30 | 6¼ | 1⅜ | 2.40 | 6¼ |
| ⅞ | 1.40 | 6¼ | 1 7/16 | 2.80 | 6¼ |
| 15/16 | 1.50 | 6¼ | 1½ | 3.10 | 6¼ |
| 1″ | 1.55 | 6¼ | | | |

# Bonding Drills

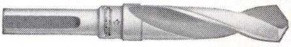
## Carbon Steel No. 95

**Code Word—LABALM**



## High Speed Steel No. 944

**Code Word—MALLET**



These drills are specially designed and tempered for drilling holes for bonding wires in track circuit signal work. Because of the High Carbon rails now in wide use, the high speed drill is recommended.

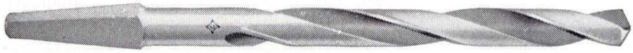
| Diameter Inches | Price per Dozen | | Shank Diameter Inches | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | |
| 9/32 | $3.80 | $7.00 | 9/32 | 1¾ | 3 |
| ⅜ | 6.00 | 11.00 | 9/32 | 1¾ | 3 |
| ⅜ | 6.00 | 11.00 | ⅜ | 1¾ | 3 |

*Always Give List Number When Ordering*

# Bit Stock Drills for Metal or Wood

## List No. 114

**Code Word—LACKEY**



| Diameter Inches | Price per Dozen | Length Overall Inches | Diameter Inches | Price per Dozen | Length Overall Inches |
|---|---|---|---|---|---|
| 1/16 | $2.50 | 3 3/8 | 5/8 | $18.00 | 7 1/2 |
| 3/32 | 2.70 | 3 5/8 | | | |
| 1/8 | 3.00 | 3 7/8 | 21/32 | 19.50 | 7 1/2 |
| | | | 11/16 | 21.00 | 7 1/2 |
| 5/32 | 3.50 | 4 1/8 | 23/32 | 22.50 | 7 1/2 |
| 3/16 | 4.00 | 4 3/8 | 3/4 | 24.00 | 7 1/2 |
| 7/32 | 4.50 | 4 5/8 | | | |
| 1/4 | 5.00 | 5 1/8 | 25/32 | 25.50 | 7 1/2 |
| | | | 13/16 | 27.00 | 7 1/2 |
| 9/32 | 6.00 | 5 1/4 | 27/32 | 28.50 | 7 1/2 |
| 5/16 | 7.00 | 5 1/2 | 7/8 | 30.00 | 7 1/2 |
| 11/32 | 8.00 | 5 3/4 | | | |
| 3/8 | 8.50 | 5 7/8 | 29/32 | 31.50 | 7 1/2 |
| | | | 15/16 | 33.00 | 7 1/2 |
| 13/32 | 9.25 | 6 | 31/32 | 34.50 | 7 1/2 |
| 7/16 | 10.50 | 6 1/4 | 1" | 36.00 | 7 1/2 |
| 15/32 | 11.75 | 6 5/8 | | | |
| 1/2 | 13.00 | 6 3/4 | 1 1/16 | 39.00 | 7 1/2 |
| | | | 1 1/8 | 42.00 | 7 1/2 |
| 17/32 | 14.25 | 7 1/2 | | | |
| 9/16 | 15.50 | 7 1/2 | 1 3/16 | 45.00 | 7 1/2 |
| 19/32 | 16.75 | 7 1/2 | 1 1/4 | 48.00 | 7 1/2 |

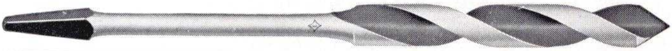
Dimensions Bit Stock Shanks 3/16" x 3/8" x 1 1/4" long.

For Bit Stock Drills in Sets see page 55.

*Always Give List Number When Ordering*

# Wood Bits for Brace—List No. 114A

Code Word—LACONIC



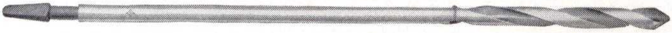
| Diameter Inches | Price Per Dozen | Length Overall Inches | Diameter Inches | Price Per Dozen | Length Overall Inches |
|---|---|---|---|---|---|
| 1/16 | $3.25 | 3½ | 13/32 | $7.50 | 8¼ |
| 3/32 | 3.25 | 4 | 7/16 | 8.00 | 8½ |
| ⅛ | 3.25 | 4½ | 15/32 | 8.75 | 8¾ |
| 5/32 | 3.50 | 5 | ½ | 9.50 | 9 |
| 3/16 | 4.00 | 5½ | 9/16 | 11.00 | 9½ |
| 7/32 | 4.50 | 6 | ⅝ | 12.50 | 9½ |
| ¼ | 5.00 | 6½ | 11/16 | 14.50 | 10 |
| 9/32 | 5.50 | 7 | ¾ | 16.50 | 10 |
| 5/16 | 6.00 | 7½ | ⅞ | 21.00 | 10 |
| 11/32 | 6.50 | 7¾ | 1 | 27.00 | 10 |
| ⅜ | 7.00 | 8 |  |  |  |

All sizes have taper square shanks 3/16″ x ⅜″ x 1¼″ long.
For Wood Bits in Sets See Page 54.

# Bell Hangers' and Electricians' Bits

## List No. 114E

Code Word—LACTEAL

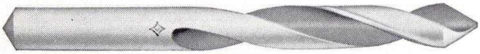


| Diameter Inches | 12-INCH | 18-INCH | 24-INCH |
|---|---|---|---|
|  | Dozen | Dozen | Dozen |
| 3/16 | $7.50 | $10.00 | $12.50 |
| ¼ | 8.00 | 10.50 | 13.00 |
| 5/16 | 8.75 | 11.00 | 13.50 |
| ⅜ | 9.50 | 12.00 | 14.50 |
| 7/16 | 10.50 | 13.00 | 15.50 |
| ½ | 12.00 | 14.50 | 17.00 |
| 9/16 | 13.50 | 16.00 | 18.50 |
| ⅝ | 15.25 | 17.75 | 20.25 |
| ¾ | 19.00 | 21.50 | 24.00 |

All sizes have taper square shanks 3/16″ x ⅜″ x 1¼″ long.

# Coopers' Dowel Drills—List No. 113

**Code Word—LACING**

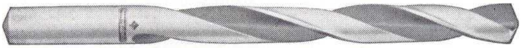


| Diameter Inches | Price Per Dozen | Length Overall Inches | Diameter Inches | Price Per Dozen | Length Overall Inches |
|---|---|---|---|---|---|
| 1/8 | $1.50 | 2 1/2 | 1/2 | $ 7.00 | 4 1/2 |
| 3/16 | 2.00 | 2 3/4 | 9/16 | 8.50 | 4 3/4 |
| 1/4 | 3.00 | 3 | 5/8 | 10.50 | 5 |
| 5/16 | 4.00 | 3 1/4 | 11/16 | 12.50 | 5 1/2 |
| 3/8 | 5.00 | 3 3/4 | 3/4 | 15.00 | 6 |
| 7/16 | 6.00 | 4 | | | |

# Straight Shank Drills for Wood

## List No. 113A

**Code Word—LACK**



**These Drills are for Wood—not for Metal.** Do not mistake these drills as intended for metal on account of their short points. Tests made at this factory, supplemented by tests by a number of our customers, have demonstrated that drills pointed with an included angle of 135 degrees have proven superior to the old style long-point drills on a great many applications of machine drilling in wood. When regrinding these drills the 135 degree angle of the point should be maintained.

| Diameter Inches | Price Per Dozen | Length Overall Inches | Diameter Inches | Price Per Dozen | Length Overall Inches |
|---|---|---|---|---|---|
| 1/32 | $1.50 | 1 1/2 | 9/32 | $ 3.80 | 4 1/4 |
| 1/16 | 1.60 | 2 1/2 | 5/16 | 4.35 | 4 1/2 |
| 3/32 | 1.70 | 2 3/4 | 11/32 | 5.05 | 4 3/4 |
| 1/8 | 1.80 | 3 | 3/8 | 6.00 | 5 |
| 5/32 | 1.90 | 3 1/4 | 13/32 | 7.00 | 5 1/4 |
| 3/16 | 2.25 | 3 1/2 | 7/16 | 8.50 | 5 1/2 |
| 7/32 | 2.75 | 3 3/4 | 15/32 | 10.00 | 5 3/4 |
| 1/4 | 3.25 | 4 | 1/2 | 12.00 | 6 |

# Machine Bits for Wood—List No. 122A

**Fitting Blacksmiths' Drill Presses**

**Code Word—LADYSHIP**

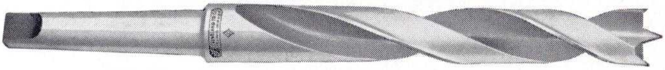
**Shanks 1/2 inch diameter and 2 1/2 inches long.**

| Diameter Inches | Price Each | Length Overall Inches | Diameter Inches | Price Each | Length Overall Inches | Diameter Inches | Price Each | Length Overall Inches |
|---|---|---|---|---|---|---|---|---|
| 1/8 | $ .50 | 5 1/8 | 15/32 | $1.10 | 7 1/2 | 13/16 | $2.20 | 10 |
| 5/32 | .55 | 5 3/8 | 1/2 | 1.20 | 7 3/4 | 27/32 | 2.40 | 10 1/4 |
| 3/16 | .60 | 5 5/8 | 17/32 | 1.30 | 8 | 7/8 | 2.60 | 10 1/2 |
| 7/32 | .65 | 5 7/8 | 9/16 | 1.40 | 8 1/4 | 29/32 | 2.80 | 10 5/8 |
| 1/4 | .70 | 6 1/8 | 19/32 | 1.50 | 8 1/2 | 15/16 | 3.00 | 10 3/4 |
| 9/32 | .75 | 6 1/4 | 5/8 | 1.60 | 8 3/4 | 31/32 | 3.25 | 10 7/8 |
| 5/16 | .80 | 6 3/8 | 21/32 | 1.70 | 9 | 1″ | 3.50 | 11 |
| 11/32 | .85 | 6 1/2 | 11/16 | 1.80 | 9 1/4 | 1 1/16 | 4.00 | 11 1/4 |
| 3/8 | .90 | 6 3/4 | 23/32 | 1.90 | 9 1/2 | 1 1/8 | 4.50 | 11 3/4 |
| 13/32 | .95 | 7 | 3/4 | 2.00 | 9 3/4 | 1 3/16 | 5.00 | 12 |
| 7/16 | 1.00 | 7 1/4 | 25/32 | 2.10 | 9 7/8 | 1 1/4 | 5.50 | 12 1/4 |

# Machine Bits for Wood, with Taper Shank

## List No. 122B

**Code Word—LAFFERTY**



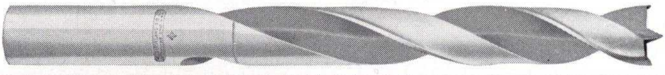
| Diameter Inches | Price Each | Length Overall Inches | Shank Taper | Diameter Inches | Price Each | Length Overall Inches | Shank Taper |
|---|---|---|---|---|---|---|---|
| 1/8 | $ .50 | 4 5/8 | No. 1 | 21/32 | $1.70 | 9 | No. 2 |
| 5/32 | .55 | 4 7/8 |  | 11/16 | 1.80 | 9 1/4 |  |
| 3/16 | .60 | 5 |  | 23/32 | 1.90 | 9 1/2 |  |
| 7/32 | .65 | 5 1/4 |  | 3/4 | 2.00 | 9 3/4 |  |
| 1/4 | .70 | 6 1/8 |  | 25/32 | 2.10 | 9 7/8 |  |
| 9/32 | .75 | 6 1/4 |  | 13/16 | 2.20 | 10 |  |
| 5/16 | .80 | 6 3/8 |  | 27/32 | 2.40 | 10 1/4 |  |
| 11/32 | .85 | 6 1/2 |  | 7/8 | 2.60 | 10 1/2 |  |
| 3/8 | .90 | 6 3/4 |  | 29/32 | 2.80 | 10 5/8 |  |
| 13/32 | .95 | 7 |  | 15/16 | 3.00 | 10 3/4 | No. 3 |
| 7/16 | 1.00 | 7 1/4 |  | 31/32 | 3.25 | 10 7/8 |  |
| 15/32 | 1.10 | 7 1/2 |  | 1″ | 3.50 | 11 |  |
| 1/2 | 1.20 | 7 3/4 |  | 1 1/16 | 4.00 | 11 1/4 |  |
| 17/32 | 1.30 | 8 |  | 1 1/8 | 4.50 | 11 3/4 |  |
| 9/16 | 1.40 | 8 1/4 |  | 1 3/16 | 5.00 | 12 |  |
| 19/32 | 1.50 | 8 1/2 | No. 2 | 1 1/4 | 5.50 | 12 1/2 |  |
| 5/8 | 1.60 | 8 3/4 |  |  |  |  |  |

***Always Give List Number When Ordering***

# Straight Shank Machine Bits for Wood

## List No. 122

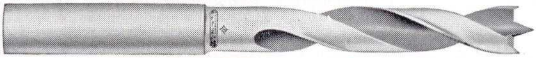
**Code Word—LADY**



| Diameter Inches | Price Each | Length Overall Inches | Diameter Inches | Price Each | Length Overall Inches |
|---|---|---|---|---|---|
| 1/8 | $ .40 | 3 | 21/32 | $1.60 | 6 3/4 |
| 5/32 | .45 | 3 1/4 | 11/16 | 1.70 | 7 |
| 3/16 | .50 | 3 1/2 | 23/32 | 1.80 | 7 1/4 |
| 7/32 | .55 | 3 3/4 | 3/4 | 1.90 | 7 1/2 |
| 1/4 | .60 | 4 | 25/32 | 2.00 | 7 3/4 |
| 9/32 | .65 | 4 1/4 | 13/16 | 2.10 | 8 |
| 5/16 | .70 | 4 1/2 | 27/32 | 2.30 | 8 1/4 |
| 11/32 | .75 | 4 3/4 | 7/8 | 2.50 | 8 1/2 |
| 3/8 | .80 | 5 | 29/32 | 2.70 | 8 3/4 |
| 13/32 | .85 | 5 1/4 | 15/16 | 2.90 | 9 |
| 7/16 | .90 | 5 1/2 | 31/32 | 3.00 | 9 1/4 |
| 15/32 | 1.00 | 5 3/4 | 1″ | 3.25 | 9 1/2 |
| 1/2 | 1.10 | 6 | 1 1/16 | 3.75 | 11 1/4 |
| 17/32 | 1.20 | 6 1/8 | 1 1/8 | 4.25 | 11 3/4 |
| 9/16 | 1.30 | 6 1/4 | 1 3/16 | 4.75 | 12 |
| 19/32 | 1.40 | 6 3/8 | 1 1/4 | 5.25 | 12 1/2 |
| 5/8 | 1.50 | 6 1/2 | | | |

# Machine Bits for Wood—List No. 169

**Code Word—LANDSON**



**Shanks 1/2 inch diameter and 2 inches long**

| Diameter Inches | Price Each | Length of Flute Inches | Length Overall Inches | Diameter Inches | Price Each | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|---|---|---|---|
| 1/8 | $ .50 | 2 3/8 | 5 | 19/32 | $1.25 | 2 3/8 | 5 |
| 5/32 | .55 | 2 3/8 | 5 | 5/8 | 1.30 | 2 3/8 | 5 |
| 3/16 | .60 | 2 3/8 | 5 | 21/32 | 1.35 | 2 3/8 | 5 |
| 7/32 | .65 | 2 3/8 | 5 | 11/16 | 1.40 | 2 3/8 | 5 |
| 1/4 | .65 | 2 3/8 | 5 | 23/32 | 1.45 | 2 3/8 | 5 |
| 9/32 | .70 | 2 3/8 | 5 | 3/4 | 1.50 | 2 3/8 | 5 |
| 5/16 | .70 | 2 3/8 | 5 | 25/32 | 1.60 | 2 3/8 | 5 |
| 11/32 | .75 | 2 3/8 | 5 | 13/16 | 1.70 | 2 3/8 | 5 |
| 3/8 | .80 | 2 3/8 | 5 | 27/32 | 1.80 | 2 3/8 | 5 |
| 13/32 | .85 | 2 3/8 | 5 | 7/8 | 1.90 | 2 3/8 | 5 |
| 7/16 | .90 | 2 3/8 | 5 | 29/32 | 2.00 | 2 3/8 | 5 |
| 15/32 | .95 | 2 3/8 | 5 | 15/16 | 2.10 | 2 3/8 | 5 |
| 1/2 | 1.00 | 2 3/8 | 5 | 31/32 | 2.20 | 2 3/8 | 5 |
| 17/32 | 1.10 | 2 3/8 | 5 | 1″ | 2.30 | 2 3/8 | 5 |
| 9/16 | 1.20 | 2 3/8 | 5 | | | | |

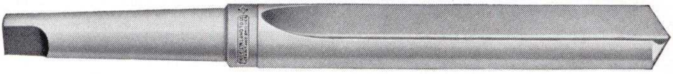
**Special**—Unless otherwise specified will always send Right Hand Bits

*Always Give List Number When Ordering*

# Carbon Steel Straight Fluted Drills

## Taper Shank Straight Fluted Drills—List No. 147

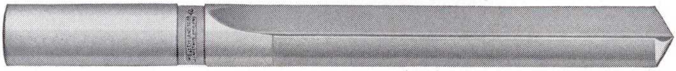
**Code Word—LANDLORD**



## Straight Shank Straight Fluted Drills—List No. 160

**(Long Set)**

**Code Word—LANDSCENE**



These Drills are especially adapted for work in brass, copper or other soft metals, as they will not run ahead or "grab." They have the same dimensions as Taper Shank Drills No. 106 on pages 18 and 19, and Straight Shank Drills No. 110 on pages 20 and 21. They will be furnished of high speed steel to order.

## Straight Shank Straight Fluted Drills—List No. 145

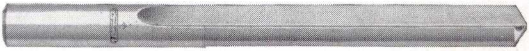
**(Short Set)**

**Code Word—LANDLESS**

## Straight Shank Straight Fluted Drills—List No. 166

**(Wire Gauge)**

**Code Word—LANDSKIT**



These Drills are especially adapted for work in brass, copper or other soft metals, as they will not run ahead or "grab." They have the same dimensions as Short Set and Wire Gauge Straight Shank Drills on pages 27 and 28. They will be furnished of high speed steel to order.

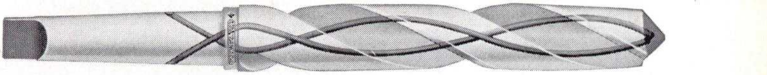
**Prices of List Numbers 147, 160, 145 and 166 on application.**

*Always Give List Number When Ordering*

## Taper Shank Oil Hole Drills

**Carbon Steel No. 91A** **High Speed Steel No. 926A**

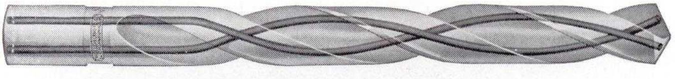
Code Word—LABAGGED Code Word—MAGNIFY



## Straight Shank Oil Hole Drills

**Carbon Steel No. 99A** **High Speed Steel No. 929A**

Code Word—LABEGAND Code Word—MAIDEN

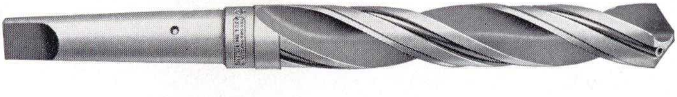


These Drills are furnished with oil holes through the solid metal for lubricant or air.

## Taper Shank Oil Tube Drills

**Carbon Steel No. 91** **High Speed Steel No. 926**

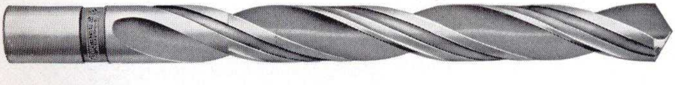
Code Word—LABAG Code Word—MAGNET



## Straight Shank Oil Tube Drills

**Carbon Steel No. 99** **High Speed Steel No. 929**

Code Word—LABEFIED Code Word—MAHOE



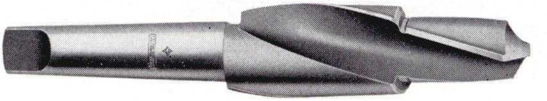
The holes in the shanks of these drills register with a channel in the body of the Oil Feeding Socket, so that when the drill is inserted in the Socket, there is a continuous feed of oil to the cutting lips of the drill.

**Prices of List Numbers 91A, 926A, 99A, 929A, 91, 926, 99 and 929 on application.**

We make Drills for special purposes. Prices on application.

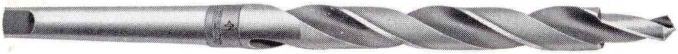
*Always Give List Number When Ordering*

# Special Drills



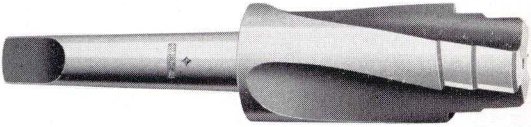
## Step Drill with Formed Angle

This type tool is designed for drilling and forming holes in one operation. The tool as shown drills the small diameter, forms or faces a shoulder at right angles to the hole, and then chamfers a 45° angle from the face to the diameter drilled by the larger section of the tool. The type of form between the two diameters may be varied to two angles or a flat face and a radius or many other combinations.



## Combination or Two Step Drill

This tool is designed for the drilling of holes of two diameters in one operation. Among the many uses of this type tool are drilling and counterboring in one operation for the head and body or for the tap and body of cap and machine screws, drilling and countersinking in one operation for wood screws, countersunk machine screws, and set screws.



## Three Flute Step Drill

This type of tool is designed for forming holes in cored castings or forgings. The tool as illustrated bores three diameters, chamfers a 45° angle between the two smaller diameters and faces the step between the second diameter and the largest diameter. The steps between the diameters may be varied to many combinations of angles, radii and square faces.

CLEVELAND

TRADE MARK REG. U. S. PAT. OFF. AND FOREIGN COUNTRIES

# Drill Sets

## In Metal Cases

**Patent No. 1,972,742**

The Cleveland Drill Sets in Metal Cases, illustrated on the following pages, offer the following advantages:

1. Utmost compactness.
2. Cases constructed to protect drills from gathering dirt and rust.
3. Cases prevent loss of drills when sets are not in actual use.
4. Cases aid in keeping out dampness and moisture.
5. All drills already set up in attractive chromium plated stands—all the user has to do is to lift the stand out of the case.
6. Quick, easy portability. (See illustrations next page.)
7. Convenience.

The Sets have been especially designed to meet all the varied needs of the machine shop worker, automotive repair shops, school machine shops, marine workers, and owners of home workshops.

Each Set is packed complete with full assortment of drills, stand (clearly marked with size of drill and its decimal equivalent) and strong metal case with cover fastener which will not permit case to open accidentally.

# S.S. Drill Sets in Metal Cases

## Fraction Sizes

Patent No. 1,972,742

51
CARBON
STEEL DRILLS
FRACTIONAL SIZES
FROM 1/16 TO 1/2 BY 64THS
51

### Carbon Steel Set No. 51

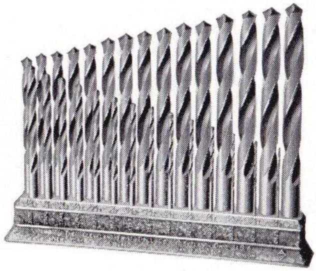
Code Word—PARLIFE

This set includes all sizes of Jobbers' straight shank drills from $\frac{1}{16}$-inch to ½-inch, by 64ths. Each drill fits into a hole plainly marked with its size, and on the side of the stand is shown the decimal equivalent of each size drill.

**Price Complete...... $17.85**

At right is shown chromium plated stand included with both sets Nos. 51 and 58. It is 8¼ inches long, 1¼ inches wide and 1⅛ inches high.

The metal cases shown above and below measure 8½ inches long, 7⅜ inches wide and 1½ inches high. Set No. 51 (above) is packed in a heavy black japanned case. Set No. 58 (below) is identical in size, but is lacquered in red.



### High Speed Steel Set No. 58

Code Word—PARLOT

Identical in all respects with Set No. 51, excepting that all drills are the famous Cle-Forge High Speed. The card shown in the inside cover of the metal case gives useful information on drill pointing, as well as the proper care of high speed drills.

**Price Complete... $29.20**

# S.S. Drill Sets in Metal Cases

## Wire Gauge Sizes

Patent No. 1,972,742

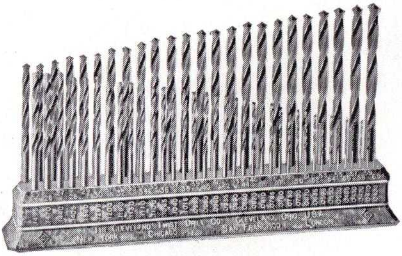
### Carbon Steel Set No. 52

**Code Word—PARLIGHT**

SET NO. 52
CLEVELAND
CARBON STEEL DRILLS
CONTAINING WIRE GAUGE SIZES
NO. 1 TO NO. 60
SET NO. 52

This set includes all the sizes of straight shank drills, steel wire gauge sizes, from No. 1 to No. 60, inclusive. The size drill fitting each hole is plainly marked, and on the side of the stand is shown the decimal equivalent of each size drill.

**Price Complete......$16.20**


THE CLEVELAND TWIST DRILL CO. CLEVELAND, OHIO, U.S.A.
NEW YORK CHICAGO SAN FRANCISCO LONDON

At left is shown chromium plated stand included with both sets Nos. 52 and 59. It is the same size as stand shown on opposite page.

The metal cases shown above and below measure 8½ inches long, 5⅛ inches wide and 1½ inches high. Set No. 52 (above) is packed in a heavy black japanned case. Set No. 59 (below) is identical in size, but is lacquered in red.

### High Speed Steel Set No. 59

**Code Word—PARLOTION**

Identical in every respect with Set No. 52, excepting that all drills are the famous Cle-Forge High Speed. The card shown in the inside cover of the metal case gives useful information on drill pointing, as well as the proper care of high speed drills.

**Price Complete..$23.30**

**Separate Stands..$5.00**
**Separate Cases...$2.50**

## Home and Farm Drill Set No. 26

Code Word—PARLANT

HOME and FARM SET No. 26
CLEVELAND
CARBON STEEL
DRILL SET

This compact, handy set consists of 8 Carbon Steel Straight Shank Drills, sizes $\frac{1}{16}''$, $\frac{3}{32}''$, $\frac{1}{8}''$, $\frac{5}{32}''$, $\frac{3}{16}''$, $\frac{7}{32}''$, $\frac{1}{4}''$ and $\frac{9}{32}''$—all carefully selected to meet the widest range of needs in the private home, on the farm, for radio repairs and minor automobile work. The drills will fit any standard hand, breast, post, or bench drill.

The set is packed in a wooden cylinder, as shown, with a handsome three-color varnished label, and equipped with a nickeled cap which revolves so that the size drill wanted can be easily and quickly found.

**List Price, per Set.................................................$1.90**

For use with Hand and Breast Drills in the Home, Farm and Shop
DRILL SETS
The Cleveland Twist Drill Co.

## Carton No. 260

Code Word—LANOL

This attractive display carton contains six Drill Sets No. 26, and has been designed for display in retail hardware and automotive supply stores. It measures 5″ wide, 10¾″ long and 2″ high, and makes an unusually striking store display.

In order to eliminate possible error in ordering, please be careful to specify "Carton No. 260" for this complete selling unit.

**List Price, per Carton............$11.40**

# Mechanic's Drill Set No. 57

**Code Word—PARLORTY**

CLEVELAND
DRILL SET
CLE·FORGE HIGH SPEED DRILLS

This set of **Cle-Forge** High Speed Drills consists of 8 sizes—$\frac{1}{16}''$, $\frac{3}{32}''$, 1/8″, $\frac{5}{32}''$, $\frac{3}{16}''$, $\frac{7}{32}''$, 1/4″ and $\frac{9}{32}''$.

It has been created to meet an insistent demand for a set of small high speed drills for use in the smaller sizes of electric drills by automobile repair shops, small machine shops, farms, vocational schools, and the thousands of individual owners of portable electric drills.

Labeled in colors, as shown above, and equipped with a nickeled revolving cap making it easy to locate any size drill instantly, this is unquestionably the most convenient small high speed drill set ever produced.

**List Price, per Set.................................... $3.55**

## Carton No. 570

**Code Word—LOVLIGHT**

This Carton holds 6 Drill Sets No. 57 and occupies little space, measuring 5″ wide, 10¾″ long and 2″ high.

As a "Silent Salesman" for the automobile supply dealer, as well as the retail hardware merchant, who is interested in selling eight drills instead of one in a single sale, it is without equal.

In order to eliminate possible error in ordering, please be careful to specify "Carton No. 570" for this complete selling unit.

**List Price, per Carton........... $21.30**

CLEVELAND DRILL SET
CLE FORGE DRILLS
CLEVELAND DRILL SET for PORTABLE ELECTRIC DRILLS

# Jobbers' Straight Shank Drill Set

## Carbon Steel No. 50

**Code Word—PARLID**

## High Speed Steel No. 54

**Code Word—PARLORISH**

This set comprises all the sizes of Jobbers' straight shank drills from $\frac{1}{16}$ inch to $\frac{1}{2}$ inch, inclusive, by 64ths. Each drill fits in a hole plainly marked with its size.

As all the 32nd sizes are on one side and the 64th sizes on the opposite side, selection is made easy.

| | |
|---|---|
| **No. 50 Set With Stand......** | **$16.00** |
| **No. 54 Set Without Stand..** | **$24.75** |
| **Stand Only....** | **$3.50** |

**(For prices of Sets Nos. 50 and 80, without stands, see page 56.)**

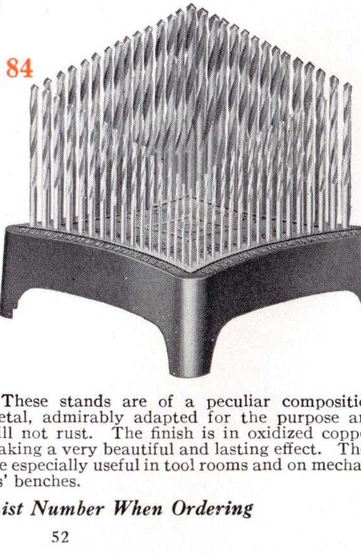
# Straight Shank Wire Gauge Drill Set

## Carbon Steel No. 80

**Code Word—PARODY**

## High Speed Steel No. 84

**Code Word—PAROSMIA**



This set comprises all the sizes of straight shank drills, steel wire gauge, from No. 1 to 60, inclusive. The size drill fitting each hole is plainly marked on the stand. As even numbers are placed on one side and odd on the other, selection is made easy.

| | |
|---|---|
| **No. 80 Set With Stand..........** | **$14.35** |
| **No. 84 Set Without Stand.....** | **$18.85** |
| **Stand Only.......** | **$3.50** |

These stands are of a peculiar composition metal, admirably adapted for the purpose and will not rust. The finish is in oxidized copper making a very beautiful and lasting effect. They are especially useful in tool rooms and on mechanics' benches.

*Always Give List Number When Ordering*

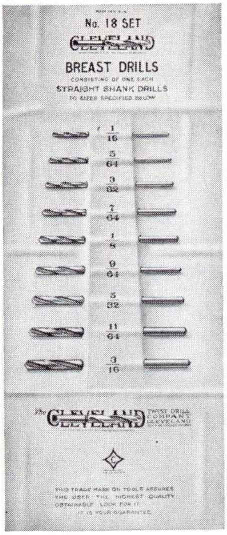
## No. 18 Set

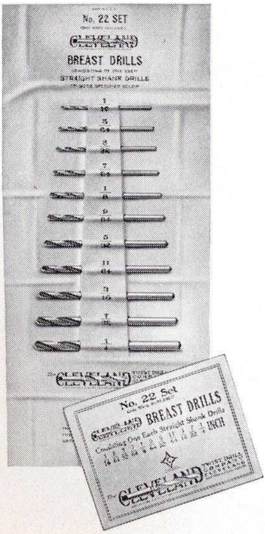
**Code Word—PARLANCIDE**

Drill Set No. 18 is designed particularly for the autoist or garage-man. Its nine straight shank drills, $\frac{1}{16}''$ to $\frac{3}{16}''$ inclusive, by 64ths, roll into a handy vest-pocket envelope of tough, non-tearing fiber.

The package keeps them in perfect condition—ready for instant use with no mussing around in the tool box for missing sizes.

**Price Complete . . . . . . . . . . . $1.60**


No. 18 SET
CLEVELAND
BREAST DRILLS
CONSISTING OF ONE EACH
STRAIGHT SHANK DRILLS
TO SIZES SPECIFIED BELOW
1/16
5/64
3/32
7/64
1/8
9/64
5/32
11/64
3/16
The CLEVELAND TWIST DRILL COMPANY CLEVELAND
THIS TRADE MARK ON TOOLS ASSURES THE USER THE HIGHEST QUALITY OBTAINABLE. LOOK FOR IT. IT IS YOUR GUARANTEE.


No. 22 SET
CLEVELAND
BREAST DRILLS
STRAIGHT SHANK DRILLS
No. 22 Set
CLEVELAND BREAST DRILLS
Consisting One Each Straight Shank Drills
INCH
The CLEVELAND TWIST DRILL COMPANY CLEVELAND

## Carbon Steel No. 22 Set

**Code Word—PARLANGU**

## High Speed Steel No. 56 Set

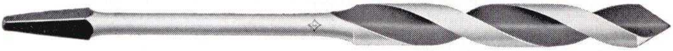
**Code Word—PARLORT**

This is a recent addition to the "Cleveland" Line of small drill sets. The addition of the two larger sizes of drills makes it most complete, and opens up a much wider range of uses. This Set appeals to automobile owners who "do their own tinkering," garage mechanics, machinists—and, in fact, everyone who uses small drills for a thousand and one purposes.

Set contains the following sizes: $\frac{1}{16}''$, $\frac{5}{64}''$, $\frac{3}{32}''$, $\frac{7}{64}''$, $\frac{1}{8}''$, $\frac{9}{64}''$, $\frac{5}{32}''$, $\frac{11}{64}''$, $\frac{3}{16}''$, $\frac{7}{32}''$, $\frac{1}{4}''$.

**No. 22 Set Complete. . . . . . .$2.10**
**No. 56 Set Complete. . . . . . .$3.85**

# Wood Bits for Brace



$\frac{1}{8}$ $\frac{5}{32}$ $\frac{3}{16}$ $\frac{7}{32}$ $\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$
CLEVELAND, OHIO
NEW YORK
CHICAGO
SAN FRANCISCO
DETROIT
LONDON
THE CLEVELAND TWIST DRILL CO.
Wood Bits

## No. 13B Set

**Code Word—PARK**

This set consists of the following sizes Wood Bits:

$\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$ inch.

They are contained in an elegant flat case, covered with dark green corduroy silk, and beautifully embossed in gold.

Size $8\frac{3}{4}$ x $3\frac{1}{2}$ x $\frac{3}{4}$ inches.

**Price complete .........$3.70**

## No. 13A Set

**Code Word—PARISIN**

This set consists of the following sizes Wood Bits:

$\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$ inch.

The round polished hardwood box that goes with this set is $2\frac{1}{2}$ inches in diameter and $8\frac{3}{4}$ inches long.

**Price complete....$4.00**

No 13A SET
CLEVELAND
WOOD BITS
TRADE MARK
THE CLEVELAND TWIST DRILL CO.
CLEVELAND, OHIO, U.S.A.
Chicago

# Bit Stock Drills for Metal or Wood

## No. 13 Set

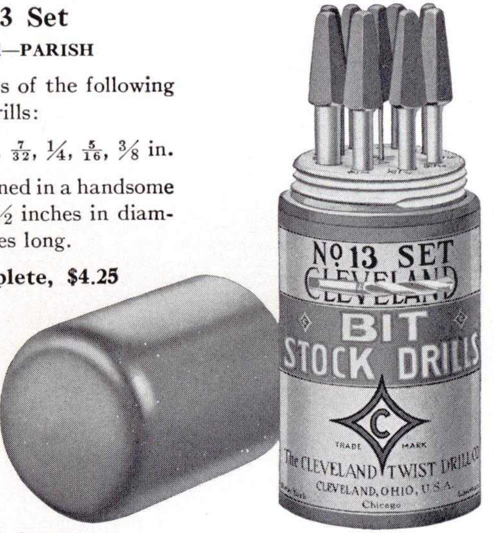
**Code Word—PARISH**

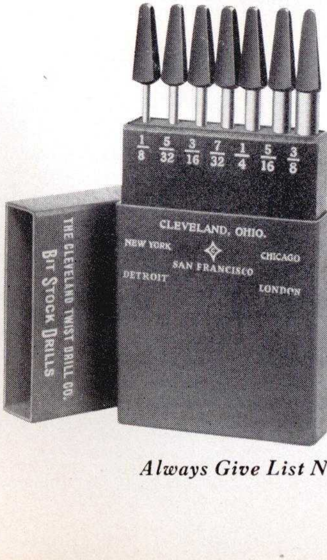
This set consists of the following sizes Bit Stock Drills:

$\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$ in.

They are contained in a handsome hardwood box, $2\frac{1}{2}$ inches in diameter and $6\frac{1}{2}$ inches long.

**Price complete, $4.25**


No 13 SET
CLEVELAND
BIT
STOCK DRILLS
TRADE MARK
The CLEVELAND TWIST DRILL CO.
CLEVELAND, OHIO, U.S.A.
Chicago


1/8 5/32 3/16 7/32 1/4 5/16 3/8
CLEVELAND, OHIO.
NEW YORK
CHICAGO
SAN FRANCISCO
DETROIT
LONDON
THE CLEVELAND TWIST DRILL CO.
BIT STOCK DRILLS

## No. 14B Set

**Code Word—PARLANCE**

This set consists of the following sizes Bit Stock Drills:

$\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$ inch.

The flat case that goes with this set is covered with a strong leatherette, green in color, gold embossed.

Size 7 x $3\frac{1}{2}$ x $\frac{3}{4}$ inches.

**Price complete, $4.35**

# Prices of Drills in Sets

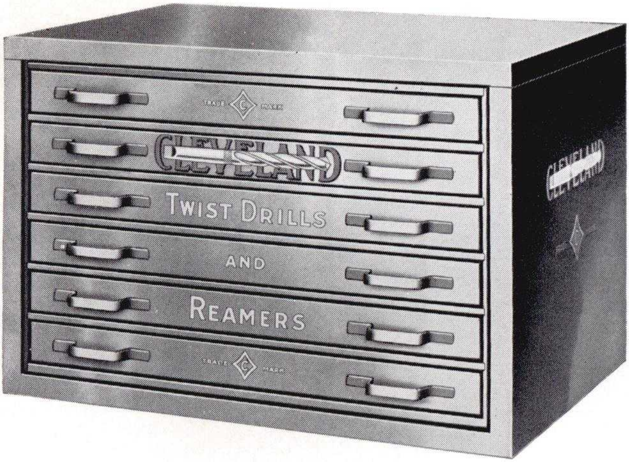
**For Code Words See Index**

| | | Price per Set with Stand or Container | Price per Set without Stand |
|---|---|---|---|
| No. 1 | Taper shank drills ¼ to 1 inch by 16ths | ...... | $22.40 |
| No. 2 | Taper shank drills ⅜ to 1¼ inch by 16ths | ...... | 40.10 |
| No. 3 | Taper shank drills ⅜ to ¾ inch by 32nds and 13/16 to 1¼ inch by 16ths | ...... | 48.50 |
| No. 5 | Short set straight shank drills 1/16 to ½ inch by 64ths, mounted on maple blocks (block only, $2.50) | $15.00 | 12.50 |
| No. 6 | Short set straight shank drills 1/16 to ½ inch by 32nds, mounted on maple blocks (block only, $2.50) | 9.50 | 7.00 |
| No. 7 | Wire gauge drills No. 1 to No. 60, short set straight shank drills ¼ to ⅜ inch by 32nds, mounted on maple blocks (block only, $2.50) | 15.75 | 13.25 |
| No. 8 | Wire gauge drills No. 1 to No. 60, mounted on maple blocks (block only, $2.50) | 13.35 | 10.85 |
| No. 9 | Wire gauge drills alternate Nos. from 1 to 59, mounted on maple blocks (block only, $2.50) | 8.50 | 6.00 |
| No. 10 | Jewelers' set of 36 drills, No. 30 (⅛ inch) to No. 65, wire gauge in mahogany case with cap (case only, $3.50) | 9.50 | 6.00 |
| No. 11 | Straight shank drills, letter size A to Z, mounted on maple blocks (block only, $2.50) | 13.50 | 11.00 |
| No. 13 | Bit stock drills, 1/16 to ¼ inch by 32nds<br>5/16 to ⅜ inch by 16ths in screw-top wooden boxes | 4.25 | ..... |
| No. 13A | Wood bits for brace, 1/16 to ¼ inch by 32nds<br>5/16 to ⅜ inch by 16ths in screw-top wooden boxes | 4.00 | ..... |
| No. 13B | Wood bits for brace, ⅛ to ¼ inch by 32nds<br>5/16 to ⅜ inch by 16ths in corduroy silk cases | 3.70 | ..... |
| No. 14B | Bit stock drills, ⅛ to ¼ inch by 32nds<br>5/16 to ⅜ inch by 16ths in leatherette cases | 4.35 | ..... |
| No. 18 | Short set straight shank drills 1/16 to 3/16 inch by 64ths, contained in convenient pocket size package | 1.60 | ..... |
| No. 22 | Short set straight shank drills 1/16 to ¼ inch (11 drills) contained in convenient pocket size package | 2.10 | ..... |
| No. 26 | Short set straight shank drills in 8 sizes from 1/16 to 9/32 inch packed in round wooden container with slide top | 1.90 | ..... |
| No. 50 | Short set straight shank drills 1/16 to ½ inch by 64ths, mounted on metal stands (stand only, $3.50) | 16.00 | 12.50 |
| No. 51 | Short set straight shank drills 1/16 to ½ inch by 64ths, mounted on metal stand, in dustproof metal carrying case | 17.85 | ..... |
| No. 52 | Wire gauge drills No. 1 to No. 60, mounted on metal stand, in dustproof metal carrying case | 16.20 | ..... |
| No. 54 | Short set straight shank high speed drills 1/16 to ½ inch by 64ths (stand only, $3.50) | ..... | 24.75 |
| No. 55 | Straight shank drills, letter size A to Z, high speed steel, mounted on maple block (block only, $2.50) | ..... | 22.50 |
| No. 56 | Short set straight shank drills 1/16 to ¼ inch (11 drills) contained in pocket size package, high speed steel | 3.85 | ..... |
| No. 57 | Short set straight shank drills in 8 sizes from 1/16 to 9/32 inch, packed in round wooden container with slide top, high speed steel | 3.55 | ..... |
| No. 58 | Short set straight shank high speed drills 1/16 to ½ inch by 64ths, on metal stand, in dustproof metal case | 29.20 | ..... |
| No. 59 | Wire gauge high speed drills No. 1 to No. 60, on metal stand, in dustproof metal case | 23.30 | ..... |
| No. 60 | Short set straight shank drills 1 m/m to 6.5 m/m by .1 m/m on metal stands (stand only, $3.50) | 14.60 | 11.10 |
| No. 80 | Wire gauge drills No. 1 to No. 60, mounted on metal stands (stand only, $3.50) | 14.35 | 10.85 |
| No. 84 | Wire gauge high speed drills No. 1 to No. 60 (stand only, $3.50) | ..... | 18.85 |

***Always Give List Number When Ordering***

# Metal Display Drill Cabinet No. 07

**Code Word—LAAP**



While designed, primarily, for the use of retail hardware and other merchants who sell twist drills and reamers over the counter, this Metal Display Drill Cabinet will be found admirably adapted to the storage of small drill stocks by mill supply distributors, hardware and automotive jobbers, and consumers.

Both Cabinet and Drawers are constructed of heavy sheet steel. Manufactured for us by one of the leading American makers of fine steel vertical filing cases, it is beautifully finished in olive-green hand-sprayed lacquer. Lettering on front and sides in red, black and silver.

The Cabinet measures 23½ inches long, 18½ inches deep including drawer pulls, and 16¼ inches high. It weighs, empty, 85 pounds, and crated for shipment, but without drills, 130 pounds.

### Drawer Arrangement

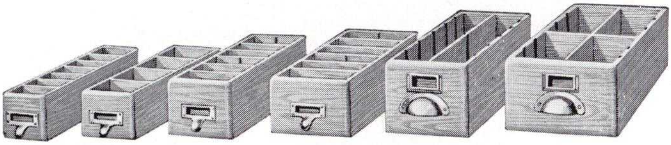
| | |
|---|---|
| No. 1 (top) | divided to hold Wire Gauge Drills No. 108A |
| No. 2 | divided to hold Fraction Size Drills No. 108 |
| No. 3 | divided to hold Fraction Size H.S. Drills No. 917 |
| No. 4 | divided to hold Bit Stock Drills No. 114 |
| No. 5 | divided to hold Blacksmiths' Drills No. 120 |
| No. 6 | not divided, to hold odd Tools and Sets. |

Ask for special circular describing this Cabinet in detail. ***Price quoted upon application.***

# Drill Drawers

## List No. 06

**Code Word—LAANE**

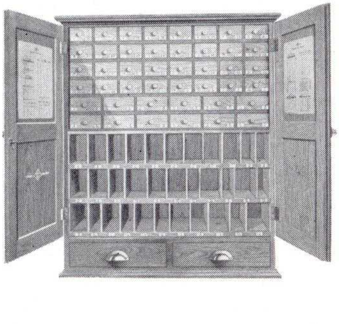


**Size No. 1 No. 2 No. 3 No. 4 No. 5 No. 6**

These Interchangeable Compartment Drawers can be easily and attractively arranged on any shelves or counters. Fronts are quartered oak, fine golden finish; bronze label holders and drawer pulls.

**Prices upon application**

| Size No. | Outside Measurements | | | Interchangeable Compartments |
|---|---|---|---|---|
| | Width Inches | Height Inches | Length Inches | |
| 1 | $3\frac{3}{16}$ | $3\frac{7}{32}$ | $15\frac{1}{2}$ | 2, 3, 4, 5, 6 or 7 |
| 2 | $3\frac{3}{4}$ | $3\frac{3}{16}$ | $15\frac{1}{2}$ | 2, 3 or 4 |
| 3 | $4\frac{1}{2}$ | $3\frac{15}{16}$ | $15\frac{1}{2}$ | 1, 2, 3, 4, 5 or 6 |
| 4 | $5\frac{5}{8}$ | $3\frac{15}{16}$ | $15\frac{1}{2}$ | 1, 2, 3, 4, 5 or 6 |
| 5 | $5\frac{5}{8}$ | $4\frac{15}{16}$ | $15\frac{1}{2}$ | 1, 2, 3, 4, 5 or 6 |
| 6 | $7\frac{1}{2}$ | $4\frac{15}{16}$ | $15\frac{1}{2}$ | 1, 2, 3, 4, 5 or 6 |



# Drill Cases No. 04

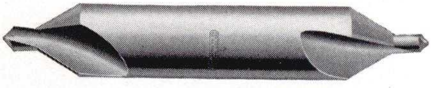
**Code Word—LAAGERED**

Holds full assortment of tools. Top drawers hold all sizes Wire Gauge and Jobbers' Straight Shank Drills. Pigeonholes hold Taper Shank Drills, Wood Bits, etc. Two lower drawers for Sockets, etc. Front and sides quarter sawed golden oak. Size —37″ wide by 16″ deep by 44″ high, outside dimensions. **Prices upon application.**

# Drills and Countersinks Combined

**Carbon Steel No. 98**
**Code Word—LABATE**

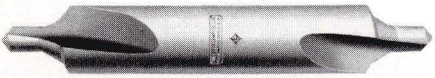
**High Speed Steel No. 998**
**Code Word—MASON**



## Bell Type

**Carbon Steel No. 96**
**Code Word—LABAR**

**High Speed Steel No. 996**
**Code Word—MASOLD**



The drill ends are both of the same diameter. The included angle of the countersink is 60°. Special sizes or angles made to order.

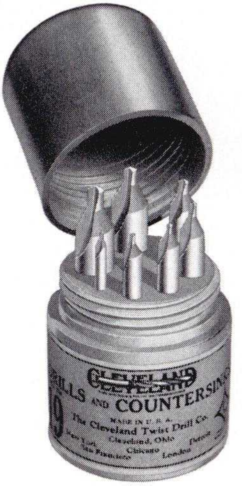
| Size | Price per Dozen | | Diam. of Body Inches | Diam. of Drills Inches | Length Overall Inches |
|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | |
| A-1 | $ 2.50 | $ 8.00 | 1/8 | 3/64 | 1 1/4 |
| C-2 | 3.00 | 8.00 | 13/64 | 1/16 | 1 7/8 |
| D-1 | 3.25 | 8.00 | 15/64 | 5/64 | 2 |
| E-1 | 3.50 | 8.00 | 3/10 | 3/32 | 2 1/8 |
| E-2 | 3.50 | 8.00 | 3/10 | 1/8 | 2 1/8 |
| F-1 | 4.50 | 12.00 | 7/16 | 5/32 | 2 3/4 |
| F-2 | 4.50 | 12.00 | 7/16 | 3/16 | 2 3/4 |
| J-1 | 5.75 | 18.00 | 1/2 | 7/32 | 3 |
| J-2 | 5.75 | 18.00 | 1/2 | 9/32 | 3 |
| M-1 | 9.00 | 24.00 | 5/8 | 7/32 | 3 1/4 |
| M-2 | 9.00 | 24.00 | 5/8 | 9/32 | 3 1/4 |
| N-1 | 11.75 | 32.00 | 3/4 | 1/4 | 3 1/2 |
| N-2 | 11.75 | 32.00 | 3/4 | 5/16 | 3 1/2 |

*Always Give List Number When Ordering*

# Drills and Countersinks Combined—Sets

**Carbon Steel No. 19** **High Speed Steel No. 49**

**Code Word—PARLAND** **Code Word—PARLIANCE**


CLEVELAND
DRILLS AND COUNTERSINKS
19
MADE IN U.S.A.
The Cleveland Twist Drill Co.
Cleveland, Ohio
New York Chicago Detroit
San Francisco London

Set No. 19 is composed of Drills and Countersinks List No. 98, sizes A1, C2, D1, E1, E2, F1, F2. This range of sizes will be found ample to cover the center hole requirements of almost every shop. The set is packed in a neat wooden box with an individual hole for each tool to avoid misplacement and to permit quick selection.

| | |
|---|---|
| **No. 19 Set price complete** | **$2.80** |
| **No. 49 Set price complete** | **6.45** |

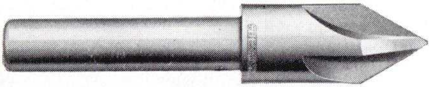
*Always Give List Number When Ordering*

# Machine Countersinks

## List No. 115A

**Code Word—LACTOR**

**Shank ½ in. diameter x 2¼ in. long**



| Diameter Inches | Price Each |
|---|---|
| ½ | $ .75 |
| ⅝ | .95 |
| ¾ | 1.10 |
| ⅞ | 1.30 |
| 1″ | 1.50 |

The included angle at point is 60°. Will furnish 80° or 82° angle when specified. Unless otherwise specified will always furnish ½ inch diameter shanks.

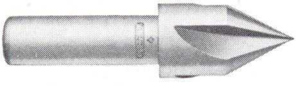
# Center Reamers

## Carbon Steel List No. 125A

**Code Word—LAGGARD**

## High Speed Steel List No. 610

**Code Word—LOWDECK**



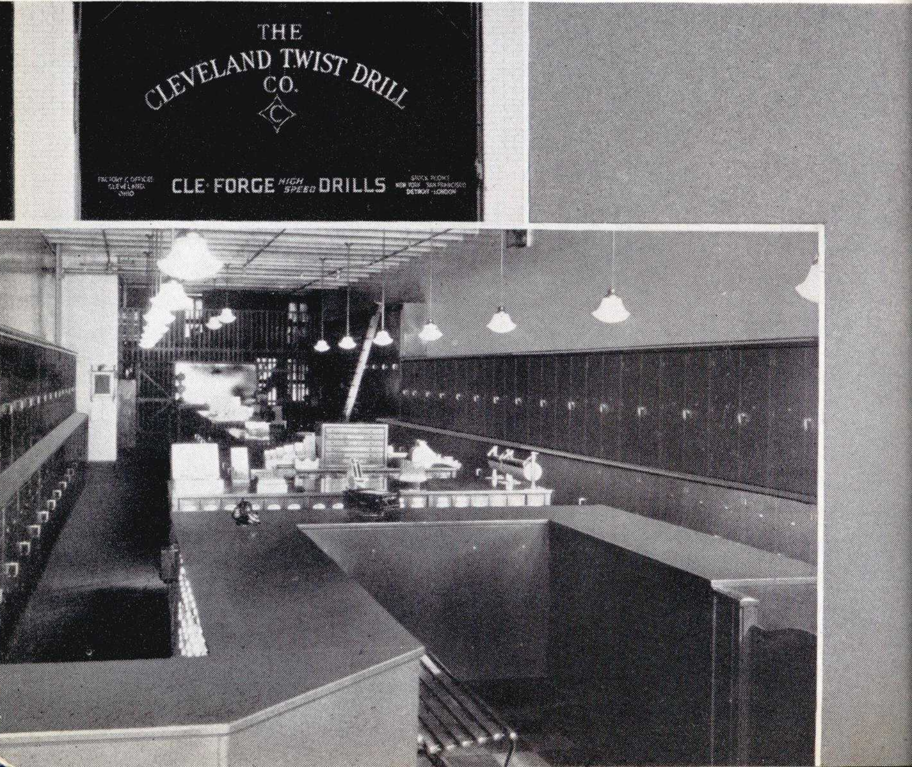
| Diameter Shank Inches | | Diameter Body Inches | Price Each | |
|---|---|---|---|---|
| | | | Carbon Steel | High Speed Steel |
| $\frac{3}{16}$ | x | ¼ | $.40 | $1.00 |
| ¼ | x | ⅜ | .45 | 1.15 |
| ⅜ | x | ½ | .55 | 1.40 |
| ⅜ | x | ⅝ | .75 | 1.75 |
| ½ | x | ¾ | .85 | 2.15 |

Special sizes made to order. The included angle is 60° unless otherwise ordered. Center Reamers with 72° or 82° included angle will be furnished at regular price. In ordering, give diameter of both shank and body.

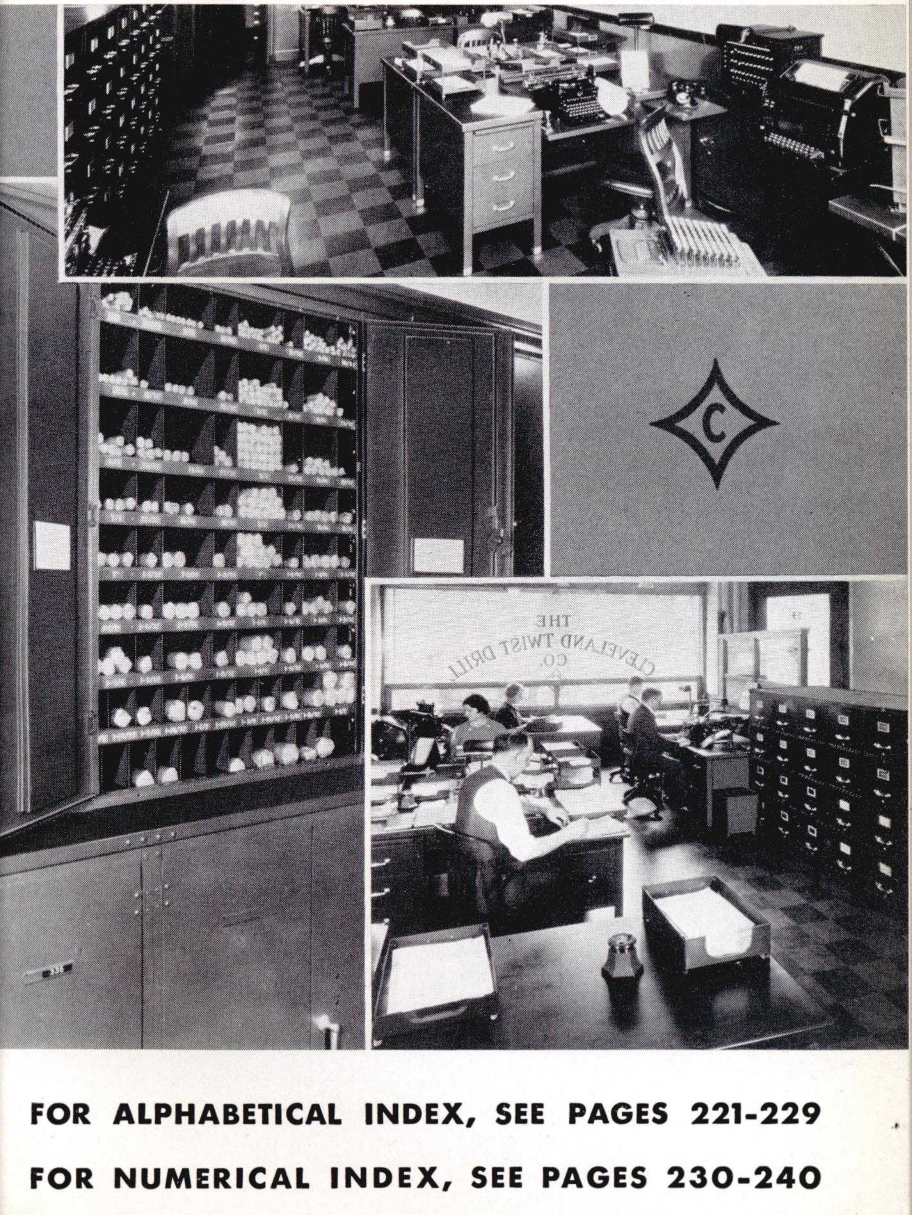
*Always Give List Number When Ordering*

The CLEVELAND TWIST DRILL Co.

**CHICAGO STOCKROOM •• ESTABLISHED SEPTEMBER 1, 1901 FOR THE PURPOSE OF SERVING A VAST GEOGRAPHICAL AREA COVERING THE GREAT MIDDLE WEST ON 24 HOURS' NOTICE FROM REGULAR STOCK**


THE
CLEVELAND TWIST DRILL
CO.
C
FACTORY & OFFICES
CLEVELAND
OHIO
CLE-FORGE HIGH SPEED DRILLS
STOCK ROOMS
NEW YORK SAN FRANCISCO
DETROIT LONDON

# CARBON AND HIGH SPEED REAMERS—AND SETS


THE
CLEVELAND TWIST DRILL
CO.

**FOR ALPHABETICAL INDEX, SEE PAGES 221-229**

**FOR NUMERICAL INDEX, SEE PAGES 230-240**

# Selecting a Reamer

THE question is often asked "What type of reamer should I use for this work " A specific answer is difficult and can rarely be given because we do not know all the conditions or the definite practice regarding reamed holes in that particular shop.

In the best of shops, the practice is to produce round, smooth, straight holes, as close to the standard or exact size as possible. All the tolerance or allowable error is above the basic or exact size. In other words, the hole must be slightly oversize, not undersize. This enables holes to be produced in large numbers, which are sure to make the proper fits. Many shops produce holes in quantity within a variation from standard size to one-half a thousandth, a mere fraction of a hair oversize. This accounts for the small wear limit allowed on standard reamers by the manufacturers. Many shops insist that all holes in parts belonging to good work must be hand reamed, and in such a manner that the work is subjected to no distortion due to holding or clamping. Usually, this is done by holding the hand reamer square in a vice and passing the reamer with a screwlike motion, the reamer scraping only a few thousandths out of the hole. Other shops insist that the holes be finished on the chucking machine, and in this case the chucking reamers must be accurate and the work not distorted by the chuck if good results are to be expected.

Some factory managers will not allow a reamer to be adjusted outside of the tool room, and with this in view will not buy a reamer that can be easily changed for size by a workman.

Other factory managers will not allow an adjustable reamer in the shop, claiming that the percentage of spoiled work due to incompetent adjustment makes it prohibitive. They have a tolerance on the interchangeable work of one thousandth of an inch and buy their reamers made one thousandth of an inch oversize. These reamers are used until the standard plug refuses to go in the hole and are then discarded for this work.

Again, there is the difference in opinion regarding the worth of high speed and carbon reamers as finishing tools, which makes the decision still harder to arrive at.

It is believed that it will be of help to our customers to state at this time a few of our ideas which have been formed by actual experience.

High Speed Steel tools, as the name indicates, are tools that have the quality of performing at a much higher rate of speed than carbon steel tools. This is, however, usually done at some sacrifice as to quality of work in regard to accuracy and finish.

Generally speaking, it is our experience that the keen cutting edge of a High Speed Steel tool loses its keenness quicker than a good Carbon Steel tool, but that after the keenness is gone, it will last longer than the Carbon Steel tool before it gets to the breaking down point, and this latter feature is one of the reasons why High Speed tools excel for production. When the keen cutting edge of a finishing reamer is gone, it is unfit to do good work where a nice, smooth hole of great accuracy is required. Therefore, if the work is not required to be greatly above the average for accuracy and smoothness, our Peerless Reamers will be found satisfactory and prove economical. The ability of our Peerless Reamers to perform at high speeds makes them an admirable production tool. High speed steel reamers will often work in metal so refractory or tough that carbon steel reamers would utterly fail. Our Peerless Reamer in either adjustable or solid type, is to be chosen according to the practice of the shop as previously outlined. Where exceedingly accurate, smooth holes are to be produced, there is no better reamer than a properly made carbon steel hand reamer, and if the work must be finished in a chucking machine, use the carbon steel chucking reamer. This is particularly true of brass and bronze. If the reamer must be kept to size and in the best condition by the tool room, our Paradox Adjustable Reamer is the one to choose, as it is essentially a finishing tool, and is so constructed that the blades are held down and back against their seat in such a manner that they become in practice a solid tool.

Where holes must be reamed by hand to fit various size pieces either in a jobbing or repair shop, Quick-Set Reamers will be found to do the work nicely.

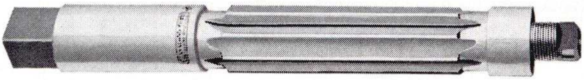
We never advocate the use of rose reamers for any other metal than free working steel, and then under the best conditions as to alignment and with a flood of lubrication.

There are occasions when these few general remarks are not applicable and we would be glad to give our best advice on the solution of these problems.

# Common Sense Expansion Reamers

## List No. 129

**Code Word—LAMBKIN**



(Eccentric Flutes)

| Diameter Inches | Price Each | Length of Flute Inches | Length Overall Inches | Diameter Inches | Price Each | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|---|---|---|---|
| $\frac{1}{4}$ | $3.00 | $1\frac{1}{2}$ | $3\frac{3}{4}$ | $1\frac{1}{32}$ | $7.25 | 4 | $8\frac{3}{4}$ |
| $\frac{9}{32}$ | 3.10 | $1\frac{5}{8}$ | $3\frac{7}{8}$ | $1\frac{1}{16}$ | 7.25 | $4\frac{1}{16}$ | 9 |
| $\frac{5}{16}$ | 3.10 | $1\frac{13}{16}$ | 4 | $1\frac{3}{32}$ | 7.75 | $4\frac{1}{8}$ | $9\frac{1}{8}$ |
| $\frac{11}{32}$ | 3.20 | $1\frac{13}{16}$ | $4\frac{1}{8}$ | $1\frac{1}{8}$ | 7.75 | $4\frac{1}{8}$ | $9\frac{1}{4}$ |
| $\frac{3}{8}$ | 3.20 | $1\frac{7}{8}$ | $4\frac{1}{4}$ | $1\frac{5}{32}$ | 8.30 | $4\frac{3}{16}$ | $9\frac{13}{32}$ |
| $\frac{13}{32}$ | 3.30 | $1\frac{7}{8}$ | $4\frac{3}{8}$ | $1\frac{3}{16}$ | 8.30 | $4\frac{3}{16}$ | $9\frac{9}{16}$ |
| $\frac{7}{16}$ | 3.30 | $1\frac{7}{8}$ | $4\frac{1}{2}$ | $1\frac{7}{32}$ | 8.90 | $4\frac{1}{4}$ | $9\frac{23}{32}$ |
| $\frac{15}{32}$ | 3.40 | $1\frac{7}{8}$ | $4\frac{3}{4}$ | $1\frac{1}{4}$ | 8.90 | $4\frac{1}{4}$ | $9\frac{7}{8}$ |
| $\frac{1}{2}$ | 3.40 | $1\frac{7}{8}$ | 5 | $1\frac{9}{32}$ | 9.50 | $4\frac{3}{8}$ | 10 |
| $\frac{17}{32}$ | 3.65 | $1\frac{15}{16}$ | $5\frac{3}{16}$ | $1\frac{5}{16}$ | 9.50 | $4\frac{7}{16}$ | $10\frac{1}{8}$ |
| $\frac{9}{16}$ | 3.65 | $2\frac{1}{16}$ | $5\frac{3}{8}$ | $1\frac{11}{32}$ | 10.50 | $4\frac{1}{2}$ | $10\frac{1}{4}$ |
| $\frac{19}{32}$ | 4.00 | $2\frac{3}{16}$ | $5\frac{9}{16}$ | $1\frac{3}{8}$ | 10.50 | $4\frac{7}{16}$ | $10\frac{3}{8}$ |
| $\frac{5}{8}$ | 4.00 | $2\frac{5}{16}$ | $5\frac{3}{4}$ | $1\frac{13}{32}$ | 11.50 | $4\frac{1}{2}$ | $10\frac{1}{2}$ |
| $\frac{21}{32}$ | 4.40 | $2\frac{1}{2}$ | 6 | $1\frac{7}{16}$ | 11.50 | $4\frac{7}{16}$ | $10\frac{5}{8}$ |
| $\frac{11}{16}$ | 4.40 | $2\frac{11}{16}$ | $6\frac{1}{4}$ | $1\frac{15}{32}$ | 12.50 | $4\frac{1}{2}$ | $10\frac{11}{16}$ |
| $\frac{23}{32}$ | 4.80 | $2\frac{3}{4}$ | $6\frac{7}{16}$ | $1\frac{1}{2}$ | 12.50 | $4\frac{1}{2}$ | $10\frac{3}{4}$ |
| $\frac{3}{4}$ | 4.80 | $2\frac{13}{16}$ | $6\frac{5}{8}$ | $1\frac{9}{16}$ | 13.00 | $4\frac{5}{8}$ | $11\frac{1}{8}$ |
| $\frac{25}{32}$ | 5.25 | 3 | $6\frac{7}{8}$ | $1\frac{5}{8}$ | 13.50 | $4\frac{3}{4}$ | $11\frac{1}{4}$ |
| $\frac{13}{16}$ | 5.25 | $3\frac{1}{16}$ | $7\frac{1}{8}$ | $1\frac{11}{16}$ | 14.00 | $4\frac{7}{8}$ | $11\frac{3}{8}$ |
| $\frac{27}{32}$ | 5.75 | $3\frac{1}{4}$ | $7\frac{3}{8}$ | $1\frac{3}{4}$ | 14.50 | 5 | $11\frac{1}{2}$ |
| $\frac{7}{8}$ | 5.75 | $3\frac{3}{8}$ | $7\frac{9}{16}$ | $1\frac{13}{16}$ | 15.00 | $5\frac{1}{8}$ | $11\frac{3}{4}$ |
| $\frac{29}{32}$ | 6.25 | $3\frac{1}{2}$ | $7\frac{13}{16}$ | $1\frac{7}{8}$ | 15.50 | 5 | $11\frac{3}{4}$ |
| $\frac{15}{16}$ | 6.25 | $3\frac{5}{8}$ | $8\frac{1}{16}$ | $1\frac{15}{16}$ | 16.00 | $5\frac{1}{8}$ | 12 |
| $\frac{31}{32}$ | 6.75 | $3\frac{13}{16}$ | $8\frac{9}{32}$ | 2″ | 16.50 | $5\frac{1}{8}$ | $12\frac{1}{4}$ |
| 1″ | 6.75 | $3\frac{7}{8}$ | $8\frac{1}{2}$ | | | | |

Limits of expansion recommended for these reamers are as follows: Sizes $\frac{1}{4}$ to $\frac{15}{32}$, .005 inch; $\frac{1}{2}$ to $\frac{31}{32}$, .008 inch; 1 inch to $1\frac{23}{32}$, .010 inch; $1\frac{3}{4}$ to 2, .012 inch. The pilots on these reamers are ground slightly undersize. Reamers for brass or bronze require special clearance and are so furnished on request.

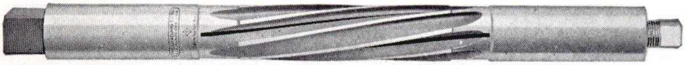
All sizes and dimensions not listed are special and subject to special prices.

*Always Give List Number When Ordering*

# Expansion Hand Reamers

## Spiral Fluted—List No. 126

**Code Word—LAIRD**



**Patent No. 1,570,040**

| Diameter Inches | Price Each | Length of Flute Inches | Length of Pilot Inches | Length Over-all Inches | Diameter Inches | Price Each | Length of Flute Inches | Length of Pilot Inches | Length Over-all Inches |
|---|---|---|---|---|---|---|---|---|---|
| 3/8 | $5.60 | 1 7/8 | 1 1/2 | 6 1/8 | 7/8 | $10.00 | 3 3/8 | 2 | 9 3/8 |
| 13/32 | 5.80 | 1 7/8 | 1 1/2 | 6 1/8 | 29/32 | 10.40 | 3 1/2 | 2 | 9 5/8 |
| 7/16 | 5.80 | 1 7/8 | 1 1/2 | 6 3/16 | 15/16 | 10.80 | 3 5/8 | 2 | 9 7/8 |
| 15/32 | 6.00 | 1 7/8 | 1 1/2 | 6 7/32 | 31/32 | 11.30 | 3 13/16 | 2 | 10 3/32 |
| 1/2 | 6.00 | 1 7/8 | 1 1/2 | 6 7/16 | .990 | 11.80 | 3 7/8 | 2 | 10 1/4 |
| 17/32 | 6.20 | 1 15/16 | 1 1/2 | 6 5/8 | 1″ | 11.80 | 3 7/8 | 2 | 10 1/4 |
| 9/16 | 6.40 | 2 1/16 | 1 1/2 | 6 25/32 | 1 1/32 | 12.20 | 4 | 2 | 10 1/2 |
| 19/32 | 6.70 | 2 3/16 | 1 1/2 | 7 | 1 1/16 | 12.60 | 4 1/16 | 2 | 10 11/16 |
| .6093 | 6.70 | 2 5/16 | 2 | 7 31/32 | 1 3/32 | 13.10 | 4 1/8 | 2 | 10 13/16 |
| 5/8 | 7.00 | 2 5/16 | 2 | 7 31/32 | 1 1/8 | 13.60 | 4 1/8 | 2 | 10 7/8 |
| 21/32 | 7.30 | 2 1/2 | 2 | 8 5/32 | 1 5/32 | 14.10 | 4 3/16 | 2 | 11 1/32 |
| .668 | 7.70 | 2 11/16 | 2 | 8 3/8 | 1 3/16 | 14.60 | 4 3/16 | 2 | 11 1/8 |
| 11/16 | 7.70 | 2 11/16 | 2 | 8 3/8 | 1 7/32 | 15.60 | 4 1/4 | 2 | 11 9/32 |
| 23/32 | 8.00 | 2 3/4 | 2 | 8 15/32 | 1.225 | 15.60 | 4 1/4 | 2 | 11 3/8 |
| .734 | 8.40 | 2 13/16 | 2 | 8 17/32 | 1.234 | 15.60 | 4 1/4 | 2 | 11 3/8 |
| .740 | 8.40 | 2 13/16 | 2 | 8 17/32 | 1 1/4 | 15.60 | 4 1/4 | 2 | 11 3/8 |
| 3/4 | 8.40 | 2 13/16 | 2 | 8 17/32 | 1 9/32 | 16.60 | 4 3/8 | 2 | 11 1/2 |
| 25/32 | 8.80 | 3 | 2 | 8 13/16 | 1 5/16 | 16.60 | 4 7/16 | 2 | 11 9/16 |
| 13/16 | 9.20 | 3 1/16 | 2 | 9 | 1 11/32 | 18.00 | 4 1/2 | 2 | 11 11/16 |
| 27/32 | 9.60 | 3 1/4 | 2 | 9 1/4 | 1 3/8 | 18.00 | 4 7/16 | 2 | 11 3/4 |
| .850 | 10.00 | 3 3/8 | 2 | 9 3/8 | 1 13/32 | 20.00 | 4 1/2 | 2 | 11 7/8 |
| .855 | 10.00 | 3 3/8 | 2 | 9 3/8 | 1 7/16 | 20.00 | 4 7/16 | 2 | 11 15/16 |
| .860 | 10.00 | 3 3/8 | 2 | 9 3/8 | 1 15/32 | 22.00 | 4 1/2 | 2 | 12 |
| .865 | 10.00 | 3 3/8 | 2 | 9 3/8 | 1 1/2 | 22.00 | 4 1/2 | 2 | 12 1/16 |

Note—Spiral Expansion Hand Reamer Set No. 36 will be found illustrated and listed on page 95.

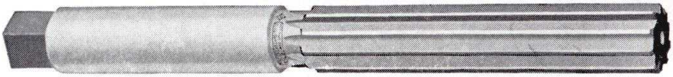
See also note at bottom of page 66.

***Always Give List Number When Ordering***

# Hand Reamers

## Carbon Steel No. 128A — High Speed Steel No. 624

**Code Word—LAMB** — **Code Word—LOWERMOST**



(Eccentric Flutes)

| Diameter Inches | Price Each Carbon Steel | Price Each High Speed | Length of Flute Inches | Length Over-all Inches | Diameter Inches | Price Each Carbon Steel | Price Each High Speed | Length of Flute Inches | Length Over-all Inches |
|---|---|---|---|---|---|---|---|---|---|
| 1/8 | $1.00 | $3.00 | 1 1/2 | 3 | 25/64 | $1.75 | .... | 2 5/8 | 5 1/4 |
| 9/64 | 1.20 | .... | 1 5/8 | 3 1/4 | 13/32 | 1.75 | $4.75 | 2 5/8 | 5 1/4 |
| 5/32 | 1.20 | 3.25 | 1 5/8 | 3 1/4 | 27/64 | 1.75 | .... | 2 3/4 | 5 1/2 |
| 11/64 | 1.20 | .... | 1 3/4 | 3 1/2 | 7/16 | 1.75 | 4.75 | 2 3/4 | 5 1/2 |
| 3/16 | 1.20 | 3.25 | 1 3/4 | 3 1/2 | 29/64 | 1.90 | .... | 2 7/8 | 5 3/4 |
| 13/64 | 1.40 | .... | 1 7/8 | 3 3/4 | 15/32 | 1.90 | 5.25 | 2 7/8 | 5 3/4 |
| 7/32 | 1.40 | 3.50 | 1 7/8 | 3 3/4 | 31/64 | 1.90 | .... | 3 | 6 |
| 15/64 | 1.40 | .... | 2 | 4 | 1/2 | 1.90 | 5.25 | 3 | 6 |
| 1/4 | 1.40 | 3.50 | 2 | 4 | 33/64 | 2.00 | .... | 3 1/8 | 6 1/4 |
| | | | | | 17/32 | 2.00 | 5.75 | 3 1/8 | 6 1/4 |
| 17/64 | 1.50 | .... | 2 1/8 | 4 1/4 | 35/64 | 2.00 | .... | 3 1/4 | 6 1/2 |
| 9/32 | 1.50 | 3.75 | 2 1/8 | 4 1/4 | 9/16 | 2.00 | 5.75 | 3 1/4 | 6 1/2 |
| 19/64 | 1.50 | .... | 2 1/4 | 4 1/2 | 37/64 | 2.20 | .... | 3 3/8 | 6 3/4 |
| 5/16 | 1.50 | 3.75 | 2 1/4 | 4 1/2 | 19/32 | 2.20 | 6.25 | 3 3/8 | 6 3/4 |
| 21/64 | 1.60 | .... | 2 3/8 | 4 3/4 | 39/64 | 2.20 | .... | 3 1/2 | 7 |
| 11/32 | 1.60 | 4.25 | 2 3/8 | 4 3/4 | 5/8 | 2.20 | 6.25 | 3 1/2 | 7 |
| 23/64 | 1.60 | .... | 2 1/2 | 5 | 41/64 | 2.40 | .... | 3 11/16 | 7 3/8 |
| 3/8 | 1.60 | 4.25 | 2 1/2 | 5 | 21/32 | 2.40 | 6.75 | 3 11/16 | 7 3/8 |

**Continued on next page**

Reamers for brass or bronze require special clearance and are so furnished on request.

All sizes and dimensions not listed are special and subject to special prices.

*Always Give List Number When Ordering*

# Hand Reamers

**Carbon Steel No. 128A**
**Code Word—LAMB**

**High Speed Steel No. 624**
**Code Word—LOWERMOST**

(Eccentric Flutes)

| Diameter Inches | Price Each | | Length of Flute Inches | Length Overall Inches | Diameter Inches | Price Each | | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | | Carbon Steel | High Speed | | |
| 43/64 | $2.40 | .... | 3 7/8 | 7 3/4 | 1 3/16 | $4.60 | $14.25 | 6 | 12 |
| 11/16 | 2.40 | $6.75 | 3 7/8 | 7 3/4 | 1 1/4 | 4.90 | 15.75 | 6 1/8 | 12 1/4 |
| 45/64 | 2.60 | .... | 4 1/16 | 8 1/8 | 1 5/16 | 5.20 | 17.25 | 6 1/4 | 12 1/2 |
| 23/32 | 2.60 | 7.25 | 4 1/16 | 8 1/8 | 1 3/8 | 5.60 | 18.75 | 6 5/16 | 12 5/8 |
| 47/64 | 2.60 | .... | 4 3/16 | 8 3/8 | 1 7/16 | 6.00 | 20.50 | 6 7/16 | 12 7/8 |
| 3/4 | 2.60 | 7.25 | 4 3/16 | 8 3/8 | 1 1/2 | 6.40 | 22.25 | 6 1/2 | 13 |
| 25/32 | 2.80 | 7.75 | 4 3/8 | 8 3/4 | 1 9/16 | 6.80 | .... | 6 1/2 | 13 |
| 13/16 | 2.80 | 7.75 | 4 9/16 | 9 1/8 | 1 5/8 | 7.20 | .... | 6 1/2 | 13 |
| 27/32 | 3.10 | 8.50 | 4 11/16 | 9 3/8 | 1 11/16 | 7.60 | .... | 6 3/4 | 13 1/2 |
| 7/8 | 3.10 | 8.50 | 4 7/8 | 9 3/4 | 1 3/4 | 8.00 | .... | 6 3/4 | 13 1/2 |
| 29/32 | 3.40 | 9.50 | 5 | 10 | 1 13/16 | 8.40 | .... | 6 3/4 | 13 1/2 |
| 15/16 | 3.40 | 9.50 | 5 1/8 | 10 1/4 | 1 7/8 | 8.80 | .... | 7 | 14 |
| 31/32 | 3.70 | 10.50 | 5 5/16 | 10 5/8 | 1 15/16 | 9.20 | .... | 7 | 14 |
| 1″ | 3.70 | 10.50 | 5 7/16 | 10 7/8 | 2″ | 9.60 | .... | 7 | 14 |
| 1 1/16 | 4.00 | 11.50 | 5 5/8 | 11 1/4 | | | | | |
| 1 1/8 | 4.30 | 12.75 | 5 13/16 | 11 5/8 | | | | | |

Reamers for brass or bronze require special clearance and are so furnished on request.

All sizes and dimensions not listed are special and subject to special prices.

***Always Give List Number When Ordering***

# Spiral Fluted Hand Reamers

## Carbon Steel No. 128C

Code Word—LAMBIA

## High Speed Steel No. 645

Code Word—LUBRICATE

| Diameter Inches | Price Each | | Length of Flute Inches | Length Over-all Inches | Diameter Inches | Price Each | | Length of Flute Inches | Length Over-all Inches |
|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | | Carbon Steel | High Speed | | |
| ⅛ | $1.20 | .... | 1½ | 3 | 23/32 | $3.10 | $8.00 | 4 1/16 | 8⅛ |
| | | | | | ¾ | 3.10 | 8.00 | 4 3/16 | 8⅜ |
| 5/32 | 1.45 | .... | 1⅝ | 3¼ | | | | | |
| 3/16 | 1.45 | .... | 1¾ | 3½ | 25/32 | 3.35 | 8.55 | 4⅜ | 8¾ |
| 7/32 | 1.70 | .... | 1⅞ | 3¾ | 13/16 | 3.35 | 8.55 | 4 9/16 | 9⅛ |
| ¼ | 1.70 | $3.85 | 2 | 4 | 27/32 | 3.70 | 9.35 | 4 11/16 | 9⅜ |
| | | | | | ⅞ | 3.70 | 9.35 | 4⅞ | 9¾ |
| 9/32 | 1.80 | 4.15 | 2⅛ | 4¼ | | | | | |
| 5/16 | 1.80 | 4.15 | 2¼ | 4½ | 29/32 | 4.10 | 10.45 | 5 | 10 |
| 11/32 | 1.90 | 4.70 | 2⅜ | 4¾ | 15/16 | 4.10 | 10.45 | 5⅛ | 10¼ |
| ⅜ | 1.90 | 4.70 | 2½ | 5 | 31/32 | 4.45 | 11.55 | 5 5/16 | 10⅝ |
| | | | | | 1″ | 4.45 | 11.55 | 5 7/16 | 10⅞ |
| 13/32 | 2.10 | 5.25 | 2⅝ | 5¼ | | | | | |
| 7/16 | 2.10 | 5.25 | 2¾ | 5½ | 1 1/16 | 4.80 | 12.65 | 5⅝ | 11¼ |
| 15/32 | 2.30 | 5.80 | 2⅞ | 5¾ | 1⅛ | 5.15 | 14.00 | 5 13/16 | 11⅝ |
| ½ | 2.30 | 5.80 | 3 | 6 | | | | | |
| | | | | | 1 3/16 | 5.50 | 15.70 | 6 | 12 |
| 17/32 | 2.40 | 6.35 | 3⅛ | 6¼ | 1¼ | 5.90 | 17.35 | 6⅛ | 12¼ |
| 9/16 | 2.40 | 6.35 | 3¼ | 6½ | | | | | |
| 19/32 | 2.65 | 6.90 | 3⅜ | 6¾ | 1 5/16 | 6.25 | 19.00 | 6¼ | 12½ |
| ⅝ | 2.65 | 6.90 | 3½ | 7 | 1⅜ | 6.70 | 20.65 | 6 5/16 | 12⅝ |
| 21/32 | 2.90 | 7.45 | 3 11/16 | 7⅜ | 1 7/16 | 7.20 | 22.55 | 6 7/16 | 12⅞ |
| 11/16 | 2.90 | 7.45 | 3⅞ | 7¾ | 1½ | 7.70 | 24.50 | 6½ | 13 |

Reamers for brass or bronze require special clearance and are so furnished on request.

All sizes and dimensions not listed are special and subject to special prices.

*Always Give List Number When Ordering*

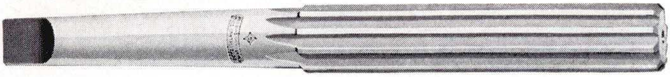
# Taper Shank Jobbers' Reamers

## Carbon Steel No. 128B

**Code Word—LAMBERT**

## High Speed Steel No. 628

**Code Word—LOWER Y**



(Eccentric Flutes)

| Diameter Inches | Price Each | | Length of Flute Inches | Length Overall Inches | Shank Taper |
|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | |
| 1/4 | $1.70 | $4.00 | 2 | 5 3/16 | No. 1 |
| 9/32 | ..... | 4.25 | 2 | 5 3/16 | |
| 5/16 | 1.80 | 4.25 | 2 1/4 | 5 1/2 | |
| 11/32 | ..... | 4.75 | 2 1/4 | 5 1/2 | |
| 3/8 | 1.90 | 4.75 | 2 1/2 | 5 13/16 | |
| 13/32 | ..... | 5.25 | 2 1/2 | 5 13/16 | |
| 7/16 | 2.15 | 5.25 | 2 3/4 | 6 1/8 | |
| 15/32 | ..... | 5.75 | 2 3/4 | 6 1/8 | |
| 1/2 | 2.30 | 5.75 | 3 | 6 7/16 | |
| 17/32 | ..... | 6.25 | 3 | 6 7/16 | |
| 9/16 | 2.40 | 6.25 | 3 1/4 | 6 3/4 | |
| 19/32 | ..... | 6.75 | 3 1/4 | 6 3/4 | |
| 5/8 | 2.65 | 6.75 | 3 1/2 | 7 9/16 | No. 2 |
| 21/32 | ..... | 7.25 | 3 1/2 | 7 9/16 | |
| 11/16 | 2.90 | 7.25 | 3 7/8 | 8 | |
| 23/32 | ..... | 7.75 | 3 7/8 | 8 | |
| 3/4 | 3.10 | 7.75 | 4 3/16 | 8 3/8 | |
| 13/16 | 3.35 | 8.50 | 4 9/16 | 8 13/16 | |
| 7/8 | 3.70 | 9.50 | 4 7/8 | 9 3/16 | |
| 15/16 | 4.10 | 10.50 | 5 1/8 | 10 | No. 3 |
| 1″ | 4.45 | 11.50 | 5 7/16 | 10 3/8 | |
| 1 1/16 | 4.80 | 12.50 | 5 5/8 | 10 5/8 | |
| 1 1/8 | 5.15 | 13.75 | 5 13/16 | 10 7/8 | |
| 1 3/16 | 5.50 | 15.25 | 6 | 11 1/8 | |
| 1 1/4 | 5.90 | 16.75 | 6 1/8 | 12 9/16 | No. 4 |
| 1 5/16 | 6.25 | 18.25 | 6 1/4 | 12 11/16 | |
| 1 3/8 | 6.70 | 19.75 | 6 5/16 | 12 13/16 | |
| 1 7/16 | 7.20 | 21.50 | 6 7/16 | 13 | |
| 1 1/2 | 7.70 | 23.25 | 6 1/2 | 13 1/8 | |

Reamers for brass or bronze require special clearance and are so furnished on request.

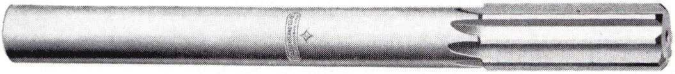
All sizes and dimensions not listed are special and subject to special prices.

***Always Give List Number When Ordering***

# Fluted Chucking Reamers

**Carbon Steel No. 134**
Code Word—LAMPOON

**High Speed Steel No. 630**
Code Word—LOWLIVED



(Eccentric Flutes)

| Diameter Inches | Price Each | | Diam. of Shank Inches | Length of Flute Inches | Length Over-all Inches |
|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | |
| 1/8 | $ .90 | $2.00 | 7/64 | 7/8 | 3½ |
| 5/32 | 1.00 | 2.50 | 9/64 | 1 | 4 |
| 3/16 | 1.00 | 2.50 | 11/64 | 1⅛ | 4½ |
| 7/32 | 1.20 | 3.00 | 13/64 | 1¼ | 5 |
| ¼ | 1.20 | 3.00 | 15/64 | 1½ | 6 |
| 9/32 | 1.30 | 3.25 | 15/64 | 1½ | 6 |
| 5/16 | 1.30 | 3.25 | 9/32 | 1½ | 6 |
| 11/32 | 1.45 | 3.75 | 9/32 | 1½ | 6 |
| 3/8 | 1.45 | 3.75 | 5/16 | 1¾ | 7 |
| 13/32 | 1.60 | 4.25 | 5/16 | 1¾ | 7 |
| 7/16 | 1.60 | 4.25 | 3/8 | 1¾ | 7 |
| 15/32 | 1.80 | 4.75 | 3/8 | 1¾ | 7 |
| ½ | 1.80 | 4.75 | 7/16 | 2 | 8 |
| 17/32 | 2.00 | 5.25 | 7/16 | 2 | 8 |
| 9/16 | 2.00 | 5.25 | 7/16 | 2 | 8 |
| 19/32 | 2.25 | 5.75 | 7/16 | 2 | 8 |
| 5/8 | 2.25 | 5.75 | 9/16 | 2¼ | 9 |
| 21/32 | 2.40 | 6.25 | 9/16 | 2¼ | 9 |
| 11/16 | 2.40 | 6.25 | 9/16 | 2¼ | 9 |

| Diameter Inches | Price Each | | Diam. of Shank Inches | Length of Flute Inches | Length Over-all Inches |
|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | |
| 23/32 | $2.55 | $6.75 | 9/16 | 2¼ | 9 |
| ¾ | 2.55 | 6.75 | 5/8 | 2½ | 9½ |
| 25/32 | 2.80 | 7.25 | 5/8 | 2½ | 9½ |
| 13/16 | 2.80 | 7.25 | 5/8 | 2½ | 9½ |
| 27/32 | 3.00 | 8.00 | 5/8 | 2½ | 9½ |
| 7/8 | 3.00 | 8.00 | ¾ | 2⅝ | 10 |
| 29/32 | 3.25 | 9.00 | ¾ | 2⅝ | 10 |
| 15/16 | 3.25 | 9.00 | ¾ | 2⅝ | 10 |
| 31/32 | 3.45 | 10.00 | ¾ | 2⅝ | 10 |
| 1″ | 3.45 | 10.00 | 7/8 | 2¾ | 10½ |
| 1 1/16 | 3.70 | 11.25 | 7/8 | 2¾ | 10½ |
| 1⅛ | 3.90 | 12.50 | 7/8 | 2⅞ | 11 |
| 1 3/16 | 4.15 | 13.75 | 1 | 2⅞ | 11 |
| 1¼ | 4.35 | 15.25 | 1 | 3 | 11½ |
| 1 5/16 | 4.60 | 17.00 | 1 | 3 | 11½ |
| 1⅜ | 4.80 | 18.75 | 1 | 3¼ | 12 |
| 1 7/16 | 5.05 | 20.50 | 1¼ | 3¼ | 12 |
| 1½ | 5.25 | 22.25 | 1¼ | 3½ | 12½ |

Reamers for brass or bronze require special clearance and are so furnished on request.

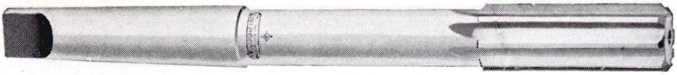
All sizes and dimensions not listed are special and subject to special prices.

*Always Give List Number When Ordering*

# Fluted Chucking Reamers with Taper Shanks

**Carbon Steel No. 134A**
**Code Word—LANCELO**

**High Speed Steel No. 632**
**Code Word—LOWMIND**



**(Eccentric Flutes)**

| Diameter Inches | Price Each | | Length of Flute Inches | Length Overall Inches | Shank Taper |
|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | |
| ¼ | $1.45 | $3.50 | 1½ | 6 | No. 1 |
| 9/32 | 1.55 | 3.75 | 1½ | 6 | |
| 5/16 | 1.55 | 3.75 | 1½ | 6 | |
| 11/32 | 1.75 | 4.25 | 1½ | 6 | |
| ⅜ | 1.75 | 4.25 | 1¾ | 7 | |
| 13/32 | 1.90 | 4.75 | 1¾ | 7 | |
| 7/16 | 1.90 | 4.75 | 1¾ | 7 | |
| 15/32 | 2.15 | 5.25 | 1¾ | 7 | |
| ½ | 2.15 | 5.25 | 2 | 8 | |
| 17/32 | 2.40 | 5.75 | 2 | 8 | |
| 9/16 | 2.40 | 5.75 | 2 | 8 | |
| 19/32 | 2.70 | 6.25 | 2 | 8 | |
| ⅝ | 2.70 | 6.25 | 2¼ | 9 | No. 2 |
| 21/32 | 2.90 | 6.75 | 2¼ | 9 | |
| 11/16 | 2.90 | 6.75 | 2¼ | 9 | |
| 23/32 | 3.05 | 7.25 | 2¼ | 9 | |
| ¾ | 3.05 | 7.25 | 2½ | 9½ | |

**Continued on next page**

Reamers for brass or bronze require special clearance and are so furnished on request.

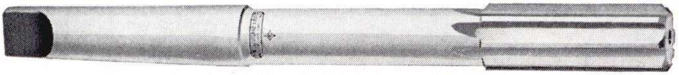
All sizes and dimensions not listed are special and subject to special prices.

*Always Give List Number When Ordering*

# Fluted Chucking Reamers with Taper Shanks

**Carbon Steel No. 134A**
**Code Word—LANCELO**

**High Speed Steel No. 632**
**Code Word—LOWMIND**



(Eccentric Flutes)

| Diameter Inches | Price Each | | Length of Flute Inches | Length Overall Inches | Shank Taper |
|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | |
| 25/32 | $3.35 | $ 8.00 | 2½ | 9½ | No. 2 |
| 13/16 | 3.35 | 8.00 | 2½ | 9½ | |
| 27/32 | 3.60 | 9.00 | 2½ | 9½ | |
| 7/8 | 3.60 | 9.00 | 2⅝ | 10 | |
| 29/32 | 3.90 | 10.00 | 2⅝ | 10 | |
| 15/16 | 3.90 | 10.00 | 2⅝ | 10 | No. 3 |
| 31/32 | 4.15 | 11.00 | 2⅝ | 10 | |
| 1″ | 4.15 | 11.00 | 2¾ | 10½ | |
| 1 1/16 | 4.45 | 12.25 | 2¾ | 10½ | |
| 1⅛ | 4.70 | 13.50 | 2⅞ | 11 | |
| 1 3/16 | 5.00 | 14.75 | 2⅞ | 11 | |
| 1¼ | 5.20 | 16.25 | 3 | 11½ | No. 4 |
| 1 5/16 | 5.50 | 18.00 | 3 | 11½ | |
| 1⅜ | 5.75 | 19.75 | 3¼ | 12 | |
| 1 7/16 | 6.05 | 21.50 | 3¼ | 12 | |
| 1½ | 6.30 | 23.25 | 3½ | 12½ | |

Reamers for brass or bronze require special clearance and are so furnished on request.

All sizes and dimensions not listed are special and subject to special prices.

*Always Give List Number When Ordering*

# Rose Chucking Reamers

**Carbon Steel No. 136**
**Code Word—LANDAU**

**High Speed Steel No. 634**
**Code Word—LOWNECK**

| Diameter Inches | Price Each |  | Diam. of Shank Inches | Length of Flute Inches | Length Over-all Inches | Diameter Inches | Price Each |  | Diam. of Shank Inches | Length of Flute Inches | Length Over-all Inches |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Carbon Steel | High Speed |  |  |  |  | Carbon Steel | High Speed |  |  |  |
| 1/8 | $ .90 | $2.00 | 7/64 | 7/8 | 3 1/2 | 5/8 | $2.25 | $5.75 | 9/16 | 2 1/4 | 9 |
| 5/32 | 1.00 | 2.50 | 9/64 | 1 | 4 | 11/16 | 2.40 | 6.25 | 9/16 | 2 1/4 | 9 |
| 3/16 | 1.00 | 2.50 | 11/64 | 1 1/8 | 4 1/2 | 3/4 | 2.55 | 6.75 | 5/8 | 2 1/2 | 9 1/2 |
| 7/32 | 1.20 | 3.00 | 13/64 | 1 1/4 | 5 |  |  |  |  |  |  |
| 1/4 | 1.20 | 3.00 | 15/64 | 1 1/2 | 6 | 13/16 | 2.80 | 7.25 | 5/8 | 2 1/2 | 9 1/2 |
|  |  |  |  |  |  | 7/8 | 3.00 | 8.00 | 3/4 | 2 5/8 | 10 |
| 9/32 | 1.30 | 3.25 | 15/64 | 1 1/2 | 6 |  |  |  |  |  |  |
| 5/16 | 1.30 | 3.25 | 9/32 | 1 1/2 | 6 | 15/16 | 3.25 | 9.00 | 3/4 | 2 5/8 | 10 |
| 11/32 | 1.45 | 3.75 | 9/32 | 1 1/2 | 6 | 1″ | 3.45 | 10.00 | 7/8 | 2 3/4 | 10 1/2 |
| 3/8 | 1.45 | 3.75 | 5/16 | 1 3/4 | 7 |  |  |  |  |  |  |
|  |  |  |  |  |  | 1 1/8 | 3.90 | 12.50 | 7/8 | 2 7/8 | 11 |
| 13/32 | 1.60 | 4.25 | 5/16 | 1 3/4 | 7 |  |  |  |  |  |  |
| 7/16 | 1.60 | 4.25 | 3/8 | 1 3/4 | 7 | 1 1/4 | 4.35 | 15.25 | 1 | 3 | 11 1/2 |
| 15/32 | 1.80 | 4.75 | 3/8 | 1 3/4 | 7 |  |  |  |  |  |  |
| 1/2 | 1.80 | 4.75 | 7/16 | 2 | 8 | 1 3/8 | 4.80 | 18.75 | 1 | 3 1/4 | 12 |
| 9/16 | 2.00 | 5.25 | 7/16 | 2 | 8 | 1 1/2 | 5.25 | 22.25 | 1 1/4 | 3 1/2 | 12 1/2 |

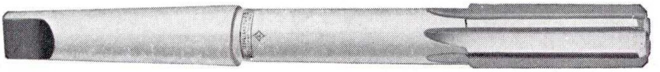
All sizes and dimensions not listed are special and subject to special prices.

*Always Give List Number When Ordering*

# Rose Chucking Reamers with Taper Shanks

**Carbon Steel No. 151**
**Code Word--LANDLUBBER**

**High Speed Steel No. 636**
**Code Word—LOYAL**



| Diameter Inches | Price Each | | Length of Flute Inches | Length Overall Inches | Shank Taper |
|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | |
| ¼ | $1.45 | $3.50 | 1½ | 6 | No. 1 |
| 9/32 | 1.55 | 3.75 | 1½ | 6 | |
| 5/16 | 1.55 | 3.75 | 1½ | 6 | |
| 11/32 | 1.75 | 4.25 | 1½ | 6 | |
| ⅜ | 1.75 | 4.25 | 1¾ | 7 | |
| 13/32 | 1.90 | 4.75 | 1¾ | 7 | |
| 7/16 | 1.90 | 4.75 | 1¾ | 7 | |
| 15/32 | 2.15 | 5.25 | 1¾ | 7 | |
| ½ | 2.15 | 5.25 | 2 | 8 | |
| 9/16 | 2.40 | 5.75 | 2 | 8 | |
| ⅝ | 2.70 | 6.25 | 2¼ | 9 | No. 2 |
| 11/16 | 2.90 | 6.75 | 2¼ | 9 | |
| ¾ | 3.05 | 7.25 | 2½ | 9½ | |
| 13/16 | 3.35 | 8.00 | 2½ | 9½ | |
| ⅞ | 3.60 | 9.00 | 2⅝ | 10 | |
| 15/16 | 3.90 | 10.00 | 2⅝ | 10 | No. 3 |
| 1″ | 4.15 | 11.00 | 2¾ | 10½ | |
| 1 1/16 | . . . . . | 12.25 | 2¾ | 10½ | |
| 1⅛ | 4.70 | 13.50 | 2⅞ | 11 | |
| 1 3/16 | . . . . . | 14.75 | 2⅞ | 11 | |
| 1¼ | 5.20 | 16.25 | 3 | 11½ | No. 4 |
| 1 5/16 | . . . . . | 18.00 | 3 | 11½ | |
| 1⅜ | 5.75 | 19.75 | 3¼ | 12 | |
| 1 7/16 | . . . . . | 21.50 | 3¼ | 12 | |
| 1½ | 6.30 | 23.25 | 3½ | 12½ | |

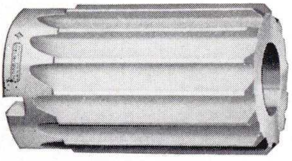
All sizes and dimensions not listed are special and subject to special prices.

***Always Give List Number When Ordering***

# Fluted Shell Reamers

**Carbon Steel No. 130A** **High Speed Steel No. 620**

**Code Word—LAMECH** **Code Word—LOWER**



(Eccentric Flutes)

| Diameter Inches | Price Each | | Size Hole Inches | Length Overall Inches | Fitting Arbor |
|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | |
| ¾ | $2.10 | $3.85 | ⅜ | 2¼ | No. 4 |
| 13/16 | 2.20 | 4.00 | ½ | 2½ | No. 5 |
| ⅞ | 2.30 | 4.25 | ½ | 2½ | |
| 15/16 | 2.40 | 4.50 | ½ | 2½ | |
| 1″ | 2.50 | 4.75 | ½ | 2½ | |
| 1 1/16 | 2.70 | 5.00 | ⅝ | 2¾ | No. 6 |
| 1⅛ | 2.90 | 5.25 | ⅝ | 2¾ | |
| 1 3/16 | 3.10 | 5.50 | ⅝ | 2¾ | |
| 1¼ | 3.30 | 5.75 | ⅝ | 2¾ | |
| 1 5/16 | 3.55 | 6.00 | ¾ | 3 | No. 7 |
| 1⅜ | 3.80 | 6.50 | ¾ | 3 | |
| 1 7/16 | 4.05 | 7.00 | ¾ | 3 | |
| 1½ | 4.30 | 7.50 | ¾ | 3 | |
| 1 9/16 | 4.55 | 8.25 | ¾ | 3 | |
| 1⅝ | 4.80 | 9.00 | ¾ | 3 | |
| 1 11/16 | 5.10 | 9.75 | 1 | 3½ | No. 8 |
| 1¾ | 5.40 | 10.50 | 1 | 3½ | |
| 1 13/16 | 5.70 | 11.25 | 1 | 3½ | |

**Continued on next page**

Shell Reamers have taper holes, the diameter given being at the large end. For Shell Reamer Arbors, see pages 80 and 81.

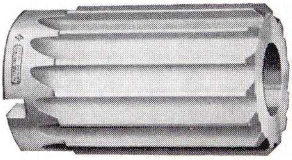
All sizes and dimensions not listed are special and subject to special prices. Reamers for brass or bronze require special clearance and are so furnished on request.

***Always Give List Number When Ordering***

# Fluted Shell Reamers

**Carbon Steel No. 130A**
Code Word—LAMECH

**High Speed Steel No. 620**
Code Word—LOWER



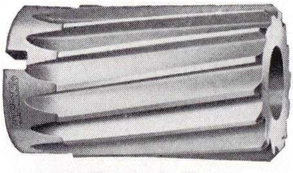
(Eccentric Flutes)

| Diameter Inches | Price Each |  | Size Hole Inches | Length Overall Inches | Fitting Arbor |
|---|---|---|---|---|---|
|  | Carbon Steel | High Speed |  |  |  |
| 1⅞ | $6.00 | $12.00 | 1 | 3½ | No. 8 |
| 1 15/16 | 6.30 | 12.75 | 1 | 3½ |  |
| 2″ | 6.60 | 13.50 | 1 | 3½ |  |
| 2 1/16 | 6.95 | 14.25 | 1¼ | 3¾ | No. 9 |
| 2⅛ | 7.30 | 15.00 | 1¼ | 3¾ |  |
| 2 3/16 | 7.65 | 15.75 | 1¼ | 3¾ |  |
| 2¼ | 8.00 | 16.50 | 1¼ | 3¾ |  |
| 2 5/16 | 8.35 | 17.25 | 1¼ | 3¾ |  |
| 2⅜ | 8.70 | 18.00 | 1¼ | 3¾ |  |
| 2 7/16 | 9.05 | 18.75 | 1¼ | 3¾ |  |
| 2½ | 9.40 | 19.50 | 1¼ | 3¾ |  |
| 2 9/16 | 9.80 | 20.50 | 1½ | 4 | No. 10 |
| 2⅝ | 10.20 | 21.75 | 1½ | 4 |  |
| 2 11/16 | 10.60 | 23.00 | 1½ | 4 |  |
| 2¾ | 11.00 | 24.25 | 1½ | 4 |  |
| 2 13/16 | 11.40 | 25.50 | 1½ | 4 |  |
| 2⅞ | 11.80 | 27.00 | 1½ | 4 |  |
| 2 15/16 | 12.20 | 28.50 | 1½ | 4 |  |
| 3″ | 12.60 | 30.00 | 1½ | 4 |  |

Shell Reamers have taper holes, the diameter given being at the large end. For Shell Reamer Arbors, see pages 80 and 81.

All sizes and dimensions not listed are special and subject to special prices. Reamers for brass or bronze require special clearance and are so furnished on request.

***Always Give List Number When Ordering***



(Eccentric Flutes)

# Spiral Fluted Shell Reamers

## Carbon Steel No. 130C

Code Word—LAMEDAL

## High Speed Steel No. 646

Code Word—LUBRICITY

| Diameter Inches | Price Each | | Size Hole Inches | Length Overall Inches | Fitting Arbor |
|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | |
| 3/4 | $2.50 | $4.25 | 3/8 | 2 1/4 | No. 4 |
| 13/16 | 2.65 | 4.40 | 1/2 | 2 1/2 | No. 5 |
| 7/8 | 2.75 | 4.70 | 1/2 | 2 1/2 | |
| 15/16 | 2.90 | 4.95 | 1/2 | 2 1/2 | |
| 1″ | 3.00 | 5.25 | 1/2 | 2 1/2 | |
| 1 1/16 | 3.25 | 5.50 | 5/8 | 2 3/4 | No. 6 |
| 1 1/8 | 3.50 | 5.80 | 5/8 | 2 3/4 | |
| 1 3/16 | 3.70 | 6.05 | 5/8 | 2 3/4 | |
| 1 1/4 | 3.95 | 6.35 | 5/8 | 2 3/4 | |
| 1 5/16 | 4.25 | 6.60 | 3/4 | 3 | No. 7 |
| 1 3/8 | 4.55 | 7.15 | 3/4 | 3 | |
| 1 7/16 | 4.85 | 7.70 | 3/4 | 3 | |
| 1 1/2 | 5.15 | 8.25 | 3/4 | 3 | |
| 1 9/16 | 5.45 | 9.10 | 3/4 | 3 | |
| 1 5/8 | 5.75 | 9.90 | 3/4 | 3 | |
| 1 11/16 | 6.10 | 10.75 | 1 | 3 1/2 | No. 8 |
| 1 3/4 | 6.50 | 11.55 | 1 | 3 1/2 | |
| 1 13/16 | 6.85 | 12.40 | 1 | 3 1/2 | |
| 1 7/8 | 7.20 | 13.20 | 1 | 3 1/2 | |
| 1 15/16 | 7.55 | 14.05 | 1 | 3 1/2 | |
| 2″ | 7.90 | 14.85 | 1 | 3 1/2 | |
| 2 1/16 | 8.35 | 15.70 | 1 1/4 | 3 3/4 | No. 9 |
| 2 1/8 | 8.75 | 16.50 | 1 1/4 | 3 3/4 | |
| 2 3/16 | 9.20 | 17.35 | 1 1/4 | 3 3/4 | |
| 2 1/4 | 9.60 | 18.15 | 1 1/4 | 3 3/4 | |
| 2 5/16 | 10.00 | 19.00 | 1 1/4 | 3 3/4 | |
| 2 3/8 | 10.45 | 19.80 | 1 1/4 | 3 3/4 | |
| 2 7/16 | 10.85 | 20.65 | 1 1/4 | 3 3/4 | |
| 2 1/2 | 11.30 | 21.45 | 1 1/4 | 3 3/4 | |
| 2 9/16 | 11.75 | 22.55 | 1 1/2 | 4 | No. 10 |
| 2 5/8 | 12.25 | 23.95 | 1 1/2 | 4 | |
| 2 11/16 | 12.70 | 25.30 | 1 1/2 | 4 | |
| 2 3/4 | 13.20 | 26.70 | 1 1/2 | 4 | |
| 2 13/16 | 13.70 | 28.05 | 1 1/2 | 4 | |
| 2 7/8 | 14.15 | 29.70 | 1 1/2 | 4 | |
| 2 15/16 | 14.65 | 31.35 | 1 1/2 | 4 | |
| 3″ | 15.10 | 33.00 | 1 1/2 | 4 | |

Shell Reamers have taper holes, the diameter given being at the large end. For Shell Reamer Arbors, see pages 80 and 81.

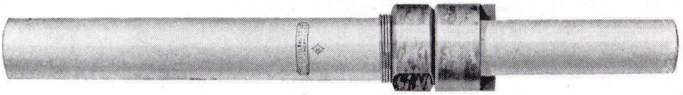
All sizes and dimensions not listed are special and subject to special prices. Reamers for brass or bronze require special clearance and are so furnished on request.

# Reamers and Arbors

## "Cleveland" Patent Arbors for Shell Tools

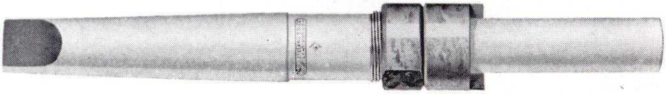
### Straight Shank—List No. 78

**Code Word—LABACITONY**



### Taper Shank—List No. 79

**Code Word—LABACITORT**



This Arbor is provided with a sliding collar which can be forced forward by a turn or two of the adjusting nut which bears on it, thus quickly releasing the shell tool, no matter how hard it may have become jammed on the arbor without removing the arbor from the machine.

The device not only saves time, but insures against the damage which so often comes from trying to force a tight fitting tool off the ordinary arbor.

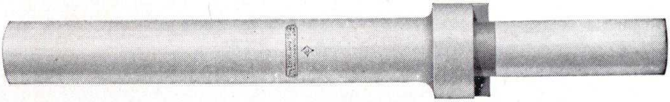
| Size No. | Price No. 78 Straight Shank | Price No. 79 Taper Shank | Fitting Sizes Inches | Diameter of Shank List No. 78 | Length Overall Inches | Shank Taper |
|---|---|---|---|---|---|---|
| 4 | $4.05 | $4.90 | 21/32 to 25/32 | 1/2 | 9 | No. 2 |
| 5 | 4.50 | 5.40 | 13/16 to 1 1/32 | 5/8 | 9 1/2 | |
| 6 | 4.95 | 5.95 | 1 1/16 to 1 9/32 | 3/4 | 10 | No. 3 |
| 7 | 5.40 | 6.45 | 1 5/16 to 1 21/32 | 7/8 | 11 | |
| 8 | 6.00 | 7.20 | 1 11/16 to 2 | 1 1/8 | 12 | No. 4 |
| 9 | 6.75 | 8.10 | 2 1/16 to 2 1/2 | 1 3/8 | 13 | |
| 10 | 7.90 | 9.45 | 2 9/16 to 3 | 1 5/8 | 14 | No. 5 |

Shell Reamers on pages 77, 78, 79, 111, 121, 122 and 131.

Shell Drills on page 26.

# Straight Shank Arbors for Shell Reamers and Shell Drills—List No. 133

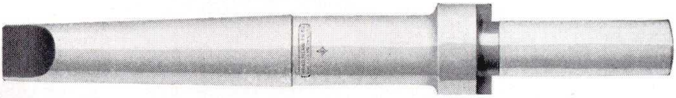
**Code Word—LAMENTABLE**



| Size No. | Price Each | Fitting Sizes List No. 130A Shell Reamer Inches | Diam. of Shank | Length Over-all Inches | Size No. | Price Each | Fitting Sizes List No. 130A Shell Reamer Inches | Diam. of Shank | Length Over-all Inches |
|---|---|---|---|---|---|---|---|---|---|
| 4 | $2.70 | $\frac{21}{32}$ to $\frac{25}{32}$ | ½ | 9 | 8 | $4.00 | $1\frac{11}{16}$ to 2 | 1⅛ | 12 |
| 5 | 3.00 | $\frac{13}{16}$ to $1\frac{1}{32}$ | ⅝ | 9½ | 9 | 4.50 | $2\frac{1}{16}$ to 2½ | 1⅜ | 13 |
| 6 | 3.30 | $1\frac{1}{16}$ to $1\frac{9}{32}$ | ¾ | 10 | 10 | 5.25 | $2\frac{9}{16}$ to 3 | 1⅝ | 14 |
| 7 | 3.60 | $1\frac{5}{16}$ to $1\frac{21}{32}$ | ⅞ | 11 | | | | | |

# Taper Shank Arbors for Shell Reamers and Shell Drills—List No. 133A

**Code Word—LAMENTING**



| Size No. | Price Each | Fitting Sizes List No. 130A Shell Reamer Inches | Length Overall Inches | Shank Taper |
|---|---|---|---|---|
| 4 | $3.25 | $\frac{21}{32}$ to $\frac{25}{32}$ | 9 | No. 2 |
| 5 | 3.60 | $\frac{13}{16}$ to $1\frac{1}{32}$ | 9½ | |
| 6 | 3.95 | $1\frac{1}{16}$ to $1\frac{9}{32}$ | 10 | No. 3 |
| 7 | 4.30 | $1\frac{5}{16}$ to $1\frac{21}{32}$ | 11 | |
| 8 | 4.80 | $1\frac{11}{16}$ to 2 | 12 | No. 4 |
| 9 | 5.40 | $2\frac{1}{16}$ to 2½ | 13 | |
| 10 | 6.30 | $2\frac{9}{16}$ to 3 | 14 | No. 5 |

Shell Reamers on pages 77, 78, 79, 111, 121, 122 and 131.
Shell Drills on page 26.

***Always Give List Number When Ordering***

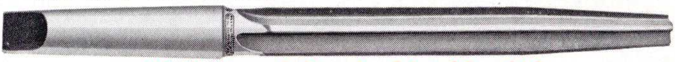
# Taper Bridge Reamers with Taper Shanks

## Carbon Steel No. 150A

Code Word—LANDLOWER

## High Speed Steel No. 615

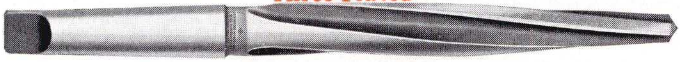
Code Word—LOWEAVE



## High Speed Steel—List No. 613

Code Word—LOWEARL

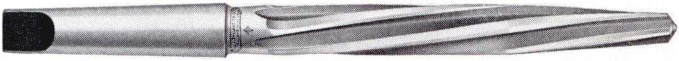
Three Fluted



**Right Hand Spiral Flutes. Right Hand Cut**

## High Speed Steel No. 616

Code Word—LOWEAVELL



**List Nos. 613 and 616 furnished in high speed steel only.**

| Full Diameter Inches | Diameter at Point Inches | Price Each | | Length of Flute Inches | Length Over-all Inches | Shank Taper |
|---|---|---|---|---|---|---|
| | | Carbon Steel | High Speed | | | |
| 1/4 | 5/32 | $2.30 | ..... | 3 3/8 | 6 3/8 | No. 1 |
| 9/32 | 11/64 | 2.40 | ..... | 3 3/4 | 6 3/4 | |
| 5/16 | 3/16 | 2.40 | ..... | 3 3/4 | 6 3/4 | |
| 11/32 | 13/64 | 2.50 | ..... | 4 | 7 1/4 | |
| 3/8 | 7/32 | 2.50 | ..... | 4 | 7 1/4 | |
| 13/32 | 15/64 | 2.60 | $3.40 | 4 3/8 | 8 1/4 | No. 2 |
| 7/16 | 1/4 | 2.60 | 3.40 | 4 3/8 | 8 1/4 | |
| 15/32 | 9/32 | 2.75 | 3.65 | 5 1/8 | 9 | |
| 1/2 | 5/16 | 2.75 | 3.65 | 5 1/8 | 9 | |
| 17/32 | 5/16 | 2.90 | 4.00 | 5 1/8 | 9 | |
| 9/16 | 3/8 | 2.90 | 4.00 | 5 1/8 | 9 | |
| 5/8 | 3/8 | 3.05 | 4.70 | 6 1/8 | 10 | |
| 11/16 | 3/8 | 3.20 | 5.50 | 7 1/8 | 11 3/4 | No. 3 |
| 3/4 | 13/32 | 3.35 | 6.00 | 7 3/8 | 12 | |
| 13/16 | 7/16 | 3.50 | 6.50 | 7 3/8 | 12 | |
| 7/8 | 15/32 | 3.75 | 7.00 | 7 3/8 | 12 | |
| 15/16 | 1/2 | 4.00 | 7.75 | 7 3/8 | 12 | |
| 1″ | 1/2 | 4.25 | 8.50 | 7 3/8 | 12 | |
| 1 1/16 | 17/32 | 4.50 | 9.50 | 7 3/8 | 12 | |
| 1 1/8 | 11/16 | 4.75 | 10.50 | 7 3/8 | 12 | |
| 1 3/16 | 3/4 | 5.00 | 11.75 | 7 3/8 | 12 | |
| 1 1/4 | 13/16 | 5.50 | 14.00 | 7 3/8 | 13 | No. 4 |
| 1 5/16 | 7/8 | 6.00 | 15.50 | 7 3/8 | 13 | |
| 1 3/8 | 1 1/16 | 6.50 | 17.50 | 7 3/8 | 13 | |
| 1 7/16 | 1 1/8 | 7.00 | 19.50 | 7 3/8 | 13 | |
| 1 1/2 | 1 3/16 | 8.00 | 22.00 | 7 3/8 | 13 | |

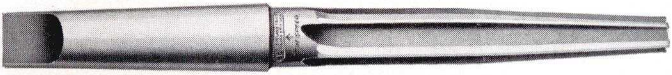
These Reamers are especially designed for severe service and particularly adapted for use in Structural Iron and Steel, Boiler Plate, etc., where precision is not absolutely required.

All sizes and dimensions not listed are special and subject to special prices.

# High Speed Taper Shank Car Reamers Short Body

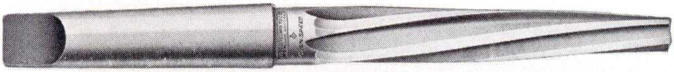
## Straight Fluted—List No. 617

Code Word—LOWEAVING



## Spiral Fluted—List No. 618

Code Word—LOWEDDING



| Full Diameter Inches | Diameter at Point Inches | Price Each | Length of Flute Inches | Length Overall Inches | Shank Taper |
|---|---|---|---|---|---|
| ¼ | 5/32 | $2.55 | 2½ | 5 7/16 | No. 1 |
| 9/32 | 11/64 | 2.55 | 2½ | 5 7/16 | |
| 5/16 | 3/16 | 2.70 | 2¾ | 5 11/16 | |
| 11/32 | 13/64 | 2.80 | 2¾ | 5 11/16 | |
| ⅜ | 7/32 | 2.80 | 2¾ | 5 11/16 | |
| 13/32 | 15/64 | 3.00 | 2¾ | 6 3/16 | No. 2 |
| 7/16 | ¼ | 3.10 | 3½ | 6 15/16 | |
| 15/32 | ¼ | 3.35 | 3½ | 7 1/16 | |
| ½ | ¼ | 3.45 | 4 | 7 9/16 | |
| 17/32 | 9/32 | 3.65 | 4 | 7 9/16 | |
| 9/16 | 5/16 | 3.65 | 4 | 7 9/16 | |
| ⅝ | 11/32 | 4.00 | 4½ | 8 1/16 | |
| 11/16 | ⅜ | 4.50 | 4½ | 8 13/16 | No. 3 |
| ¾ | 13/32 | 5.00 | 5 | 9½ | |
| 13/16 | 7/16 | 5.35 | 5 | 9½ | |
| ⅞ | 15/32 | 5.70 | 5 | 9½ | |
| 15/16 | ½ | 6.20 | 5 | 9½ | |
| 1″ | ½ | 6.75 | 5 | 9½ | |
| 1 1/16 | 17/32 | 7.50 | 5 | 9½ | |
| 1⅛ | 11/16 | 8.25 | 5 | 9½ | |
| 1 3/16 | ¾ | 9.25 | 5 | 9½ | |
| 1¼ | 13/16 | 11.00 | 5 | 9½ | |

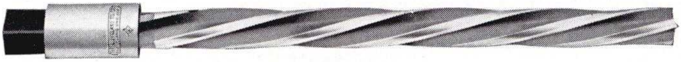
*Always Give List Number When Ordering*

# Taper Locomotive Reamers

## High Speed Steel No. 647

Code Word—LUCID

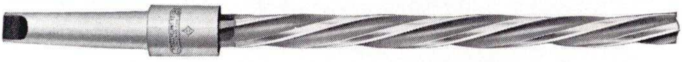
SQUARE SHANK FOUR FLUTED



## High Speed Steel No. 648

Code Word—LUCIFER

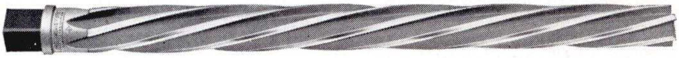
TAPER SHANK FOUR FLUTED



## Carbon Steel No. 158 — High Speed Steel No. 651

Code Word—LANDSCEBY — Code Word—LUDA

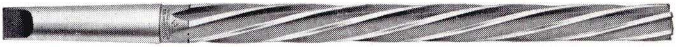
SQUARE SHANK SIX FLUTED



## Carbon Steel No. 159 — High Speed Steel No. 652

Code Word—LANDSCEDAL — Code Word—LUDACING

TAPER SHANK SIX FLUTED



## Carbon Steel No. 141 — High Speed Steel No. 638

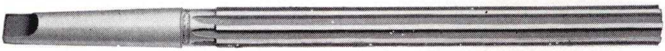
Code Word—LANDFALL — Code Word—LOYALTY

SQUARE SHANK ECCENTRIC FLUTES

## Carbon Steel No. 157 — High Speed Steel No. 640

Code Word—LANDSCEAR — Code Word—LOZENGE

TAPER SHANK ECCENTRIC FLUTES



### Important Note

Taper Locomotive Reamers (with the exception of List Nos. 647 and 648) can be furnished either in Carbon or High Speed Steel, according to the above List Numbers, with $\frac{1}{16}''$ taper. Tapers other than this are special. **Prices upon application.**

# Standard Taper Pin Reamers

Taper ¼ inch per foot

## Straight Flute

**Carbon Steel No. 137**
Code Word—LANDBANK

**High Speed Steel No. 657**
Code Word—LUDER

## Spiral Flute

**Carbon Steel No. 139**
Code Word—LANDER

**High Speed Steel No. 659**
Code Word—LUDIAL

| Size No. | Price Each | | | | Diameter of Shank Inches | Diameter at Large End Inches | Diameter at Small End Inches | Length of Flute Inches | Length Over-all Inches |
|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steel No. 137 | High Speed No. 657 | Carbon Steel No. 139 | High Speed No. 659 | | | | | |
| 7/0 | $1.75 | $3.50 | $2.10 | $3.85 | 5/64 | .0666 | .0497 | 13/16 | 1 13/16 |
| 6/0 | 1.60 | 3.50 | 1.95 | 3.85 | 3/32 | .0806 | .0611 | 15/16 | 1 15/16 |
| 5/0 | 1.50 | 3.25 | 1.80 | 3.60 | 7/64 | .0966 | .0719 | 1 3/16 | 2 3/16 |
| 4/0 | 1.50 | 3.25 | 1.80 | 3.60 | 1/8 | .1142 | .0869 | 1 5/16 | 2 5/16 |
| 3/0 | 1.50 | 3.25 | 1.80 | 3.60 | 9/64 | .1302 | .1029 | 1 5/16 | 2 5/16 |
| 2/0 | 1.35 | 3.00 | 1.65 | 3.30 | 5/32 | .1462 | .1137 | 1 9/16 | 2 9/16 |
| 0 | 1.00 | 2.80 | 1.20 | 3.10 | 11/64 | .1638 | .1287 | 1 11/16 | 2 15/16 |
| 1 | 1.00 | 2.90 | 1.20 | 3.20 | 3/16 | .1798 | .1447 | 1 11/16 | 2 15/16 |
| 2 | 1.25 | 3.00 | 1.50 | 3.30 | 13/64 | .2008 | .1605 | 1 15/16 | 3 3/16 |
| 3 | 1.50 | 3.00 | 1.80 | 3.30 | 15/64 | .2294 | .1813 | 2 5/16 | 3 11/16 |
| 4 | 1.75 | 3.25 | 2.10 | 3.60 | 17/64 | .2604 | .2071 | 2 9/16 | 4 1/16 |
| 5 | 2.00 | 3.50 | 2.40 | 3.85 | 5/16 | .2994 | .2409 | 2 13/16 | 4 5/16 |
| 6 | 2.25 | 4.25 | 2.70 | 4.70 | 23/64 | .354 | .2773 | 3 11/16 | 5 7/16 |
| 7 | 2.50 | 5.25 | 3.00 | 5.80 | 13/32 | .422 | .3297 | 4 7/16 | 6 5/16 |
| 8 | 3.00 | 6.75 | 3.60 | 7.45 | 7/16 | .505 | .3971 | 5 3/16 | 7 3/16 |
| 9 | 3.50 | 8.25 | 4.20 | 9.10 | 9/16 | .6066 | .4805 | 6 1/16 | 8 5/16 |
| 10 | 4.50 | 9.00 | 5.40 | 9.90 | 5/8 | .7216 | .5799 | 6 13/16 | 9 5/16 |

These Reamers are all of the same taper and the point of each Reamer will enter the hole reamed by the next size smaller.

*Always Give List Number When Ordering*

Spirex

TRADE MARK REG. U. S. PAT. OFF.

# Machine Taper Pin Reamers

## Carbon Steel No. 140

**Code Word—LANDEZ**

## High Speed Steel No. 650

**Code Word—LUCY**

Spirex Machine Taper Pin Reamers are designed especially for the shop producing pin holes by machine reaming—for which work only reamers of this type can be profitably and economically used.

Due to the special Spirex construction, chips do not tend to pack in the flutes. Hence, breakage is practically eliminated. For this reason, Spirex should, and will, displace all other types of straight and spiral fluted taper pin reamers for machine use.

The very pronounced spiral angle makes it difficult to feed a Spirex Reamer by hand. Nevertheless, it is so free-cutting that, in many cases, it can be so used.

**Can be supplied, also, with taper shanks, if desired.**

**(Taper ¼-inch per foot)**

| Size No. | Price Each | | Diameter of Shank Inches | Diameter at Large End Inches | Diameter at Small End Inches | Length of Flute Inches | Length Over-all Inches |
|---|---|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | | | |
| 7/0 | $2.25 | $2.75 | 5/64 | .0666 | .0497 | 13/16 | 1 13/16 |
| 6/0 | 2.00 | 2.50 | 3/32 | .0806 | .0611 | 15/16 | 1 15/16 |
| 5/0 | 2.00 | 2.50 | 7/64 | .0966 | .0719 | 1 3/16 | 2 3/16 |
| 4/0 | 2.00 | 2.50 | 1/8 | .1142 | .0869 | 1 5/16 | 2 5/16 |
| 3/0 | 1.75 | 2.25 | 9/64 | .1302 | .1029 | 1 5/16 | 2 5/16 |
| 2/0 | 1.75 | 2.25 | 5/32 | .1462 | .1137 | 1 9/16 | 2 9/16 |
| 0 | 1.75 | 2.25 | 11/64 | .1638 | .1287 | 1 11/16 | 2 15/16 |
| 1 | 2.00 | 2.50 | 3/16 | .1798 | .1447 | 1 11/16 | 2 15/16 |
| 2 | 2.25 | 2.75 | 13/64 | .2008 | .1605 | 1 15/16 | 3 3/16 |
| 3 | 2.50 | 3.00 | 15/64 | .2294 | .1813 | 2 5/16 | 3 11/16 |
| 4 | 2.75 | 3.50 | 17/64 | .2604 | .2071 | 2 9/16 | 4 1/16 |
| 5 | 3.00 | 3.75 | 5/16 | .2994 | .2409 | 2 13/16 | 4 5/16 |
| 6 | 3.50 | 4.25 | 23/64 | .354 | .2773 | 3 11/16 | 5 7/16 |
| 7 | 4.00 | 5.00 | 13/32 | .422 | .3297 | 4 7/16 | 6 5/16 |
| 8 | 4.50 | 5.75 | 7/16 | .505 | .3971 | 5 3/16 | 7 3/16 |
| 9 | 5.00 | 6.25 | 9/16 | .6066 | .4805 | 6 1/16 | 8 5/16 |
| 10 | 6.00 | 7.50 | 5/8 | .7216 | .5799 | 6 13/16 | 9 5/16 |

## "Spirex" Reamer with Special Taper

**(See "Special Reamers"—pages 137 and 138)**

***Always Give List Number When Ordering***

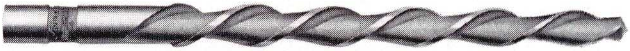
# Spirex

TRADE MARK REG. U. S. PAT OFF.

## Die-Sinking Reamers

**Carbon Steel No. 154**
**Code Word—LANDRUT**

**High Speed Steel No. 654**
**Code Word—LUDALE**



**Taper ¾ degree included angle, or .013 per Inch**

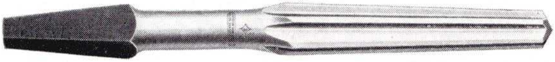
| Size No. | Price Each |  | Diameter at Large End Inches | Diameter at Small End Inches | Length of Flute Inches | Length Over-all Inches |
|---|---|---|---|---|---|---|
|  | Carbon Steel | High Speed |  |  |  |  |
| AAA | $2.50 | $3.00 | .070 | .055 | 1⅛ | 2¼ |
| AA | 2.50 | 3.00 | .080 | .065 | 1⅛ | 2¼ |
| A | 2.50 | 3.00 | .090 | .075 | 1⅛ | 2¼ |
| B | 2.25 | 2.75 | .103 | .085 | 1⅜ | 2⅜ |
| C | 2.25 | 2.75 | .113 | .095 | 1⅜ | 2½ |
| D | 2.25 | 2.75 | .126 | .105 | 1⅝ | 2⅝ |
| E | 2.25 | 2.75 | .136 | .115 | 1⅝ | 2¾ |
| F | 2.50 | 3.00 | .148 | .125 | 1¾ | 3 |
| G | 2.50 | 3.00 | .158 | .135 | 1¾ | 3 |
| H | 2.75 | 3.50 | .169 | .145 | 1⅞ | 3¼ |
| I | 2.75 | 3.50 | .184 | .160 | 1⅞ | 3¼ |
| J | 2.75 | 3.50 | .199 | .175 | 1⅞ | 3¼ |
| K | 3.50 | 4.25 | .219 | .190 | 2¼ | 3½ |
| L | 3.50 | 4.25 | .234 | .205 | 2¼ | 3½ |
| M | 3.50 | 4.25 | .252 | .220 | 2½ | 4 |
| N | 4.00 | 5.00 | .274 | .235 | 3 | 4½ |
| O | 4.25 | 5.25 | .296 | .250 | 3½ | 5 |
| P | 4.50 | 5.50 | .327 | .275 | 4 | 5½ |
| Q | 4.75 | 5.75 | .358 | .300 | 4½ | 6 |
| R | 5.00 | 6.00 | .397 | .335 | 4¾ | 6½ |
| S | 5.25 | 6.25 | .435 | .370 | 5 | 6¾ |
| T | 5.50 | 6.75 | .473 | .405 | 5¼ | 7 |
| U | 5.75 | 7.00 | .511 | .440 | 5½ | 7¼ |

Sizes not listed are special and take special prices.

*Always Give List Number When Ordering*

# Bit Stock Taper Reamers—List No. 137A

Code Word—LANDBEAM



| Size Inches | Price Each | Length of Flute Inches | Length Overall Inches | Size Inches | Price Each | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|---|---|---|---|
| 1/8 | $ .60 | 1 5/8 | 3 3/4 | 5/8 | $ .95 | 2 5/8 | 4 3/4 |
| 3/16 | .60 | 1 3/4 | 3 7/8 | 11/16 | 1.10 | 2 3/4 | 4 7/8 |
| 1/4 | .60 | 1 7/8 | 4 | 3/4 | 1.25 | 2 7/8 | 5 |
| 5/16 | .60 | 2 | 4 1/8 | 13/16 | 1.50 | 3 | 5 1/8 |
| 3/8 | .65 | 2 1/8 | 4 1/4 | 7/8 | 1.75 | 3 1/8 | 5 1/4 |
| 7/16 | .70 | 2 1/4 | 4 3/8 | 15/16 | 2.00 | 3 1/4 | 5 3/8 |
| 1/2 | .75 | 2 3/8 | 4 1/2 | 1″ | 2.25 | 3 3/8 | 5 1/2 |
| 9/16 | .80 | 2 1/2 | 4 5/8 | | | | |

These Reamers have a taper of 1″ to the foot. They are about 1/16″ larger at the large end than the size stamped on the shank and the point of each reamer will enter the hole reamed by the next size smaller.

All sizes have taper square shanks 3/16″ x 3/8″ x 1 1/4″ long.

# Repairman's Taper Reamers

## List No. 142

Code Word—LANDING

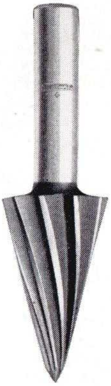
| Size No. | Price Each | Diameter | | Length | |
|---|---|---|---|---|---|
| | | Large End | At Point | Flute | Overall |
| 1 | $1.00 | 1/2 | 1/8 | 3 1/2 | 5 1/2 |
| 2 | 1.50 | 1 | 3/8 | 4 1/2 | 6 1/2 |

This is an ideal reamer for practically every type of reaming job where quick work is required. Farmers and others with home workshops find this reamer useful, because it eliminates the necessity and expense of several different sizes. It is also extensively used by electricians, telephone linemen, auto repairmen, plumbers, carpenters, machinists, blacksmiths, and others, for increasing the size of holes in all materials

*Always Give List Number When Ordering*

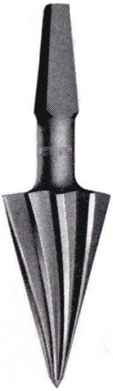
# Burring Reamers

## With Spiral Flutes



**CODE WORDS**

**List No. 232......LANHAM**
**List No. 233......LANHER**
**List No. 234......LANHIT**
**List No. 241......LANHOME**
**List No. 242......LANHOOK**
**List No. 242½....LANHORN**
**List No. 244......LANHOWL**



**Nos. 232 to 234**

**No. 241 to 244**

While designed, and especially ground, for use in a wide variety of materials, Cleveland Burring Reamers are primarily intended for the removal of burrs from cut pipe and conduit. They may be used, also, for smoothing down the rough edges of an extensive range of light materials. Frequently they can be used for countersinking.

**Straight Shank List Nos. 232 to 234 are for use in electric drills. They can be furnished, if desired, in high speed steel (prices upon application). List Nos. 241 to 244 are for use in a Brace or Hand Drill.**

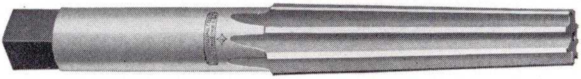
**Carbon Steel**

| Order by this No. | Price Each | Style of Shank | Capacity Pipe Inches | Diam. Inches | |
|---|---|---|---|---|---|
| | | | | At Point | At Large End |
| 232 | $1.25 | ½″ Round | ⅛ to 1″ | $\frac{3}{16}$ | 1¼ |
| 233 | 1.50 | ½″ Round | ¼ to 1¼ | ¼ | 1$\frac{15}{32}$ |
| 234 | 3.00 | ½″ Round | ¼ to 2 | ¼ | 2$\frac{17}{64}$ |
| 241 | 1.00 | Bit Brace | ⅛ to ½ | $\frac{3}{16}$ | $\frac{47}{64}$ |
| 242 | 1.25 | Bit Brace | ⅛ to 1 | $\frac{3}{16}$ | 1¼ |
| 242½ | 1.50 | Bit Brace | ¼ to 1¼ | ¼ | 1$\frac{15}{32}$ |
| 244 | 3.00 | Bit Brace | ¼ to 2 | ¼ | 2$\frac{17}{64}$ |

# Taper Socket Reamers

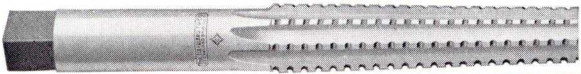
## Finishing Reamers—List No. 144

**Code Word—LANDLAG**



## Roughing Reamers—List No. 144A

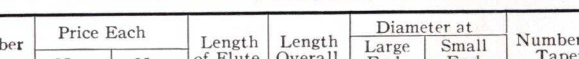
**Code Word—LANDLAGGER**



| No. of Taper | Price Each | | Length of Flute Inches | Length Overall Inches | Diameters at | | |
|---|---|---|---|---|---|---|---|
| | No. 144 | No. 144A | | | Large End Inches | Small End Inches | Shank Inches |
| 0 | $1.60 | $1.90 | 2¼ | 3¾ | .367 | .250 | 5/16 |
| 1 | 2.00 | 2.40 | 3 | 5 | .517 | .367 | 7/16 |
| 2 | 2.60 | 3.10 | 3½ | 6 | .745 | .569 | ⅝ |
| 3 | 3.40 | 4.10 | 4¼ | 7¼ | .988 | .775 | ⅞ |
| 4 | 4.20 | 5.05 | 5¼ | 8½ | 1.289 | 1.017 | 1⅛ |
| 5 | 6.60 | 7.90 | 6¼ | 9¾ | 1.799 | 1.471 | 1½ |
| 6 | 12.00 | 14.40 | 8½ | 12¼ | 2.555 | 2.112 | 2 |

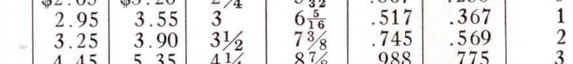
## Finishing Reamers—List No. 144B

**Code Word—LANDLAGGY**



## Roughing Reamers—List No. 144C

**Code Word—LANDLAKE**



| Number of Taper | Price Each | | Length of Flute Inches | Length Overall Inches | Diameter at | | Number of Taper Shank |
|---|---|---|---|---|---|---|---|
| | No. 144 B | No. 144 C | | | Large End Inches | Small End Inches | |
| 0 | $2.65 | $3.20 | 2¼ | 5 11/32 | .367 | .250 | 0 |
| 1 | 2.95 | 3.55 | 3 | 6 5/16 | .517 | .367 | 1 |
| 2 | 3.25 | 3.90 | 3½ | 7⅜ | .745 | .569 | 2 |
| 3 | 4.45 | 5.35 | 4¼ | 8⅞ | .988 | .775 | 3 |
| 4 | 6.00 | 7.20 | 5¼ | 10⅞ | 1.289 | 1.017 | 4 |
| 5 | 10.10 | 12.10 | 6¼ | 13⅛ | 1.799 | 1.471 | 5 |
| 6 | 21.35 | 25.60 | 8½ | 17 13/16 | 2.555 | 2.112 | 6 |

All sizes, dimensions and tapers not listed are special and subject to special prices.

***Always Give List Number When Ordering***

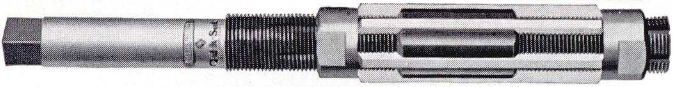
# Quick-Set

## Adjustable Reamer

TRADE MARK REG. U.S. PAT. OFF.

**Carbon Steel**
**List No. 148**
**Code Word—LANDLORDER**

**High Speed Steel**
**List No. 649**
**Code Word—LUCRE**



QUICK-SET ADJUSTABLE REAMERS are made in what we believe to be the best-equipped factory in America for the manufacture of this particular type of reamer. This accounts, in large measure, for their wide reputation for great accuracy, as well as their capacity for adjustment to very close limits.

Quick-Set Reamer bodies are tough machinery steel. They are threaded as illustrated and the tool is adjusted by loosening one nut and tightening the other. This moves the blades in the six slots, which are milled with

*(Continued on next page)*

| Size | Price Each | | Dimensions Inches | Dimensions m/m | Length Overall Inches |
|---|---|---|---|---|---|
| | Carbon Steel | High Speed Steel | | | |
| 4/A | $3.50 | $4.75 | 3/8 to 13/32 | 9.5 to 10.25 | 4 3/4 |
| 3/A | 4.00 | 5.25 | 13/32 to 7/16 | 10.25 to 11. | 5 |
| 2/A | 4.00 | 5.25 | 7/16 to 15/32 | 11. to 12. | 5 1/4 |
| A | 4.50 | 5.75 | 15/32 to 17/32 | 12. to 13.5 | 5 1/2 |
| B | 4.50 | 5.75 | 17/32 to 19/32 | 13.5 to 15. | 5 3/4 |
| C | 4.75 | 6.00 | 19/32 to 21/32 | 15. to 16.75 | 6 1/2 |
| D | 4.75 | 6.25 | 21/32 to 23/32 | 16.75 to 18.25 | 6 3/4 |
| E | 5.00 | 6.50 | 23/32 to 25/32 | 18.25 to 19.75 | 7 |
| F | 5.00 | 6.80 | 25/32 to 27/32 | 19.75 to 21.5 | 7 3/8 |
| G | 5.50 | 7.10 | 27/32 to 15/16 | 12.5 to 23.75 | 8 |
| H | 5.80 | 7.85 | 15/16 to 1 1/16 | 23.75 to 27. | 9 |
| I | 7.00 | 8.75 | 1 1/16 to 1 3/16 | 27. to 30.25 | 10 |
| J | 8.00 | 10.00 | 1 3/16 to 1 11/32 | 30.25 to 34.25 | 11 |
| K | 10.00 | 12.50 | 1 11/32 to 1 1/2 | 34.25 to 38. | 12 |
| L | 11.50 | 15.00 | 1 1/2 to 1 13/16 | 38. to 46. | 14 |
| M | 15.00 | 18.75 | 1 13/16 to 2 7/32 | 46. to 56. | 16 |
| N | 25.00 | 31.50 | 2 7/32 to 2 3/4 | 56. to 70. | 18 |
| O | 35.00 | 44.00 | 2 3/4 to 3 11/32 | 70. to 85. | 20 |

As indicated, each reamer expands to the smallest size of the next larger reamer: thereby eliminating many odd sizes which would otherwise be necessary.

***Quick-Set Can Be Furnished in Millimeter Sizes***

# Quick-Set
## Adjustable Reamer

TRADE MARK REG. U.S. PAT. OFF.

**Carbon Steel**
**List No. 148**
**Code Word—LANDLORDER**

**High Speed Steel**
**List No. 649**
**Code Word—LUCRE**

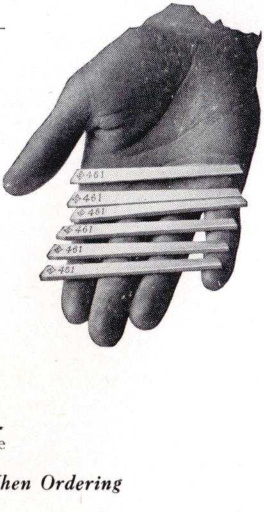
*(Continued)*

taper bottoms in the body. The six blades are hardened and ground, by special equipment, to close limits.

So accurately ground are Quick-Set Reamer blades that when, after long, hard service, new blades are required you can replace them right in your own shop without grinding or fitting! It pays, therefore, always to buy an extra set of blades every time you buy a new size Quick-Set. Blades are carried in stock, in all sizes, for immediate shipment and use.

## Extra Quick-Set Blades and Nuts

| Blades to Fit Size | Length Cutting Edge Inches | List Price Blades per Set (6) | | List Price Extra Nuts |
|---|---|---|---|---|
| | | Carbon Steel | High Speed Steel | |
| 4/A | 1½ | $1.50 | $3.90 | $.25 |
| 3/A | 1½ | 1.80 | 3.90 | .30 |
| 2/A | 1⅝ | 1.80 | 3.90 | .30 |
| A | 1⅝ | 1.80 | 4.20 | .30 |
| B | $1\frac{13}{16}$ | 1.80 | 4.20 | .30 |
| C | $2\frac{1}{16}$ | 1.80 | 4.20 | .30 |
| D | $2\frac{3}{16}$ | 1.80 | 4.20 | .30 |
| E | 2½ | 2.10 | 4.50 | .35 |
| F | 2⅝ | 2.10 | 4.50 | .35 |
| G | 3 | 2.40 | 4.80 | .40 |
| H | 3¼ | 2.40 | 4.80 | .40 |
| I | 3⅜ | 2.70 | 5.10 | .45 |
| J | 3⅞ | 2.70 | 5.10 | .45 |
| K | 4¼ | 3.30 | 6.00 | .50 |
| L | $4\frac{7}{16}$ | 3.90 | 8.10 | .60 |
| M | 5 | 4.20 | 9.90 | .70 |
| N | $4\frac{13}{16}$ | 5.40 | 13.75 | .90 |
| O | $5\frac{3}{16}$ | 7.20 | 18.35 | 1.20 |



In ordering blades be sure to specify letter size stamped in shank of Reamer.

*Always Give List Number When Ordering*

# Quick-Set
## Adjustable Reamer

TRADE MARK REG. U.S. PAT. OFF.

## In Sets

Set No. 44
Quick-Set
Adjustable Reamer
This Symbol on Tools is a Guarantee of Quality
Quick-Set

### No. 44 Set

**Code Word—PARLIAGENT**

Set No. 44 is the ideal combination for garages and repair shops which require reamers in a wide range of sizes.

This set comprises eleven Quick-Set Reamers sizes A to K inclusive—a range which will handle reaming jobs from $\frac{15}{32}$″ to 1½″. Particular attention is called to the great strength of the smaller sizes—thereby practically eliminating reamer breakage.

Set No. 44 comes packed in a handsomely polished case hinged cover with a receptacle for extra blades.

**Price Complete $64.80**

### No. 45 Set

**Code Word—PARLIAGYZE**

Set No. 45
Quick-Set
Adjustable Reamer
Quick-Set

No. 45 is offered to meet an insistent demand for a small set to include the smaller sizes and provide a range best adapted to everyday garage and repair shop work. This Set comprises eight Quick-Set Reamers sizes A to H inclusive. These Reamers can be adjusted to ream any size hole from $\frac{15}{32}$″ to 1$\frac{1}{16}$″.

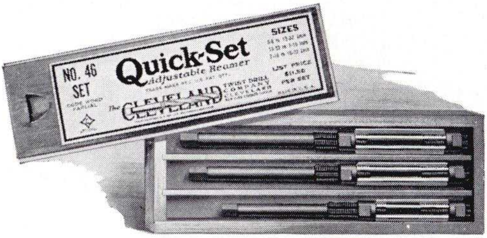
Set No. 45 comes in a strong polished case with slide cover and individual compartments for each reamer.

**Price Complete $39.80**

*For Single Quick-Set Reamers—See Page 91*

## No. 46 Set

**Code Word—PARLIAL**



Set No. 46 is offered for the use of the mechanic who needs adjustable reamers for small holes. It is, also, an ideal set for the farm shop, as well as for the home tool chest. No. 46 consists of three Quick-Set Reamers, sizes 4/A, 3/A and 2/A. These reamers can be adjusted to ream any size hole from 3/8″ to 15/32″. The set is packed in a small, strong wooden case, with slide cover and individual compartments for each reamer. **Price Complete $11.50**

## No. 42 Set

**Code Word—PARLEYING**

Set No. 42 is designed to take care of the every day garage needs and although it does not contain the small or very large reamers, it will take care of the majority of the reaming operations in the garage at a moderate cost.

This set comprises six Quick-Set Reamers, sizes C to H inclusive. These reamers may be adjusted to ream any size hole from 19/32″ to 1 1/16″.

Set No. 42 comes in a polished case with slide cover and individual compartments for each reamer. **Price Complete $30.80**

**Sets on this page, as well as on page 93, can be furnished with high speed steel blades. (*Prices of Sets upon application.*)**

***For Single Quick-Set Reamers—See Page 91***

# Taper Pin Reamer Sets

## No. 30 Set—Straight Flute

**Code Word—PARLEAPT**

This set was especially designed for the automobile kit. It consists of the following sizes of Taper Pin Reamers: 0, 1, 2, 3, 4, 5.

They are put up in a round wooden box, five inches high by two in diameter, handsomely finished in dark maroon.

**Price Complete $9.75**

No. 30 Set
CLEVELAND
TAPER PIN REAMERS
Nos. 0, 1, 2, 3, 4, 5
THE CLEVELAND TWIST DRILL CO.
CLEVELAND, O., U.S.A.

## No. 35 Set—Spiral Flute

**Code Word—PARLEMENT**

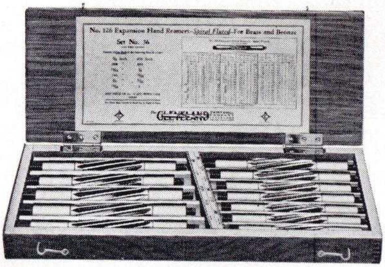
Contains sizes 0, 1, 2, 3, 4, 5 in same size and style box as Set No. 30.

**Price Complete $11.25**

# Spiral Fluted Expansion Hand Reamer

## No. 36 Set

**Code Word—PARLENZ**


No. 126 Expansion Hand Reamers—Spiral Fluted—For Brass and Bronze
Set No. 36
CLEVELAND

In this set are included the most popular sizes of Hand Reamer No. 126 listed on page 67. In the individual compartments at the left are sizes .860, 7/8, 15/16, 31/32 and 1″; in compartments at the right are sizes 5/8, .668, 11/16, .740, 3/4, 13/16 and .850—twelve reamers.

**Price Complete, Including Case, $120.00**

# Prices of Reamers in Sets

**For Code Words See Index**

Cut shows Set No. 27C, comprising Hand Reamers from 1/4 to 1 1/2 inch by 16ths. The cases are of oak, finely polished. Each tool has its own groove, thus preventing any injury by contact, and making selection easy.

CLEVELAND
TWIST DRILL CO.
CLEVELAND, O. U.S.A.
NEW YORK CHICAGO
LONDON

| | | | | |
|---|---|---|---|---|
| No. 27A Set— | Hand Reamers, | 1/4 to 1 | inch by 16ths, in case, complete | $38.50 |
| No. 27B " | " " | 1/4 to 1 1/4 | " " 16ths, " " " | 58.25 |
| No. 27C " | " " | 1/4 to 1 1/2 | " " 16ths, " " " | 82.00 |
| No. 27E " | " " | 1/4 to 1 | " " 32nds, " " " | 68.75 |
| No. 27F " | " " | 1/4 to 1 inch by 32nds and 1 1/16 to 1 1/4 by 16ths | | 90.00 |
| No. 27G " | " " | 1/4 to 1 inch by 32nds and 1 1/16 to 1 1/2 by 16ths | | 119.50 |
| No. 32 Set— | Socket " | Nos. 1 to 5, inclusive, | | 25.00 |

RAILWAY EXPRESS AGENCY
INTER-URBAN EXPRESS
THE CLEVELAND TWIST DRILL CO.
654
CLE-FORGE HIGH SPEED DRILLS
FACTORY & OFFICES
CLEVELAND OHIO
STORE ROOMS
NEW YORK CHICAGO
DETROIT
LONDON

**PACIFIC COAST STOCKROOM •• ESTABLISHED SEPTEMBER 15, 1927, FOR THE PURPOSE OF SERVING "CLEVELAND" DISTRIBUTORS FROM THE ROCKY MOUNTAINS TO THE PACIFIC OCEAN, AND FROM BRITISH COLUMBIA TO MEXICO**

# PEERLESS HIGH SPEED REAMERS

TRADE MARK REG. U.S. PAT. OFF.

**FOR ALPHABETICAL INDEX, SEE PAGES 221-229**

**FOR NUMERICAL INDEX, SEE PAGES 230-240**

# PEERLESS HIGH SPEED REAMERS

TRADE MARK REG. U.S. PAT. OFF.

**The "Peerless" High Speed Reamer**

Our process of "Brazo-Hardening" high speed blades in a machinery steel body produces the "Peerless" High Speed Reamer, which has been the world's leading production reamer for over 20 years.

**Maximum Toughness Minimum Cost**

The machinery steel bodies make the reamers extremely tough and permit them to be marketed at a price considerably below that of solid high speed reamers because the expensive high speed steel is used only in the blades or cutting parts.

**The "Peerless" High Speed Expansion Reamer**

The expanding feature of the "Peerless" Reamer makes it an ideal low cost, high production tool, because when the reamer becomes dull it may be expanded and resharpened, not once but many times, to be put in its original serviceable condition. Such an advantage cannot be had in any solid reamer, which when worn is useless for its standard size.

**For Machine Reamers and Turret Lathes**

"Peerless" Reamers are in a class by themselves for all machine reaming. We recommend them without hesitation, knowing they will prove their own best advocates.

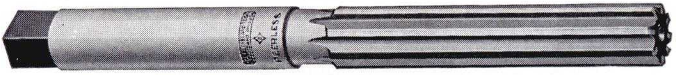
# PEERLESS HIGH SPEED REAMERS

TRADE MARK REG. U.S. PAT. OFF.

## "Peerless" Hand Reamers

### List No. 501

**Code Word—LOADER**



| Diameter Inches | Price Each | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|
| 1/2 | $2.85 | 3 | 6 |
| 17/32 | 3.00 | 3 1/8 | 6 1/4 |
| 9/16 | 3.10 | 3 1/4 | 6 1/2 |
| 19/32 | 3.20 | 3 3/8 | 6 3/4 |
| 5/8 | 3.30 | 3 1/2 | 7 |
| 21/32 | 3.45 | 3 11/16 | 7 3/8 |
| 11/16 | 3.60 | 3 7/8 | 7 3/4 |
| 23/32 | 3.75 | 4 1/16 | 8 1/8 |
| 3/4 | 3.90 | 4 3/16 | 8 3/8 |
| 25/32 | 4.10 | 4 3/8 | 8 3/4 |
| 13/16 | 4.30 | 4 9/16 | 9 1/8 |
| 27/32 | 4.50 | 4 11/16 | 9 3/8 |
| 7/8 | 4.70 | 4 7/8 | 9 3/4 |
| 29/32 | 4.90 | 5 | 10 |
| 15/16 | 5.15 | 5 1/8 | 10 1/4 |
| 31/32 | 5.40 | 5 5/16 | 10 5/8 |
| 1" | 5.65 | 5 7/16 | 10 7/8 |
| 1 1/16 | 6.40 | 5 5/8 | 11 1/4 |
| 1 1/8 | 7.20 | 5 13/16 | 11 5/8 |
| 1 3/16 | 8.00 | 6 | 12 |
| 1 1/4 | 8.80 | 6 1/8 | 12 1/4 |
| 1 5/16 | 9.60 | 6 1/4 | 12 1/2 |
| 1 3/8 | 10.40 | 6 5/16 | 12 5/8 |
| 1 7/16 | 11.20 | 6 7/16 | 12 7/8 |
| 1 1/2 | 12.00 | 6 1/2 | 13 |

*Always Give List Number When Ordering*

# PEERLESS HIGH SPEED REAMERS

TRADE MARK REG. U.S. PAT. OFF.

## "Peerless" Expansion Hand Reamers

### List No. 502

**Code Word—LOAF**

| Diameter Inches | Price Each | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|
| 1/2 | $4.50 | 3 | 6 |
| 17/32 | 4.75 | 3 1/8 | 6 1/4 |
| 9/16 | 5.00 | 3 1/4 | 6 1/2 |
| 19/32 | 5.25 | 3 3/8 | 6 3/4 |
| 5/8 | 5.50 | 3 1/2 | 7 |
| 21/32 | 5.75 | 3 11/16 | 7 3/8 |
| 11/16 | 6.00 | 3 7/8 | 7 3/4 |
| 23/32 | 6.25 | 4 1/16 | 8 1/8 |
| 3/4 | 6.50 | 4 3/16 | 8 3/8 |
| 25/32 | 6.75 | 4 3/8 | 8 3/4 |
| 13/16 | 7.00 | 4 9/16 | 9 1/8 |
| 27/32 | 7.25 | 4 11/16 | 9 3/8 |
| 7/8 | 7.50 | 4 7/8 | 9 3/4 |
| 29/32 | 7.80 | 5 | 10 |
| 15/16 | 8.10 | 5 1/8 | 10 1/4 |
| 31/32 | 8.50 | 5 5/16 | 10 5/8 |
| 1" | 8.90 | 5 7/16 | 10 7/8 |

| Diameter Inches | Price Each | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|
| 1 1/16 | $ 9.70 | 5 5/8 | 11 1/4 |
| 1 1/8 | 10.70 | 5 13/16 | 11 5/8 |
| 1 3/16 | 11.70 | 6 | 12 |
| 1 1/4 | 12.90 | 6 1/8 | 12 1/4 |
| 1 5/16 | 14.20 | 6 1/4 | 12 1/2 |
| 1 3/8 | 15.65 | 6 5/16 | 12 5/8 |
| 1 7/16 | 17.15 | 6 7/16 | 12 7/8 |
| 1 1/2 | 18.60 | 6 1/2 | 13 |
| 1 9/16 | 19.60 | 6 1/2 | 13 |
| 1 5/8 | 20.70 | 6 1/2 | 13 |
| 1 11/16 | 21.80 | 6 3/4 | 13 1/2 |
| 1 3/4 | 23.00 | 6 3/4 | 13 1/2 |
| 1 13/16 | 24.25 | 6 3/4 | 13 1/2 |
| 1 7/8 | 25.55 | 7 | 14 |
| 1 15/16 | 26.90 | 7 | 14 |
| 2" | 28.40 | 7 | 14 |

*Always Give List Number When Ordering*

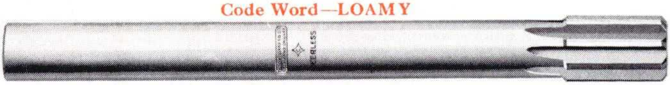
# PEERLESS HIGH SPEED REAMERS

TRADE MARK REG. U.S. PAT. OFF

## "Peerless" Straight Shank Chucking Reamers

### List No. 503

Code Word—LOAMY



| Diameter Inches | Price Each | Diameter of Shank Inches | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|---|
| 1/2 | $2.50 | 7/16 | 1 | 8 |
| 17/32 | 2.60 | 7/16 | 1 | 8 |
| 9/16 | 2.70 | 7/16 | 1 1/8 | 8 |
| 19/32 | 2.80 | 7/16 | 1 1/8 | 8 |
| 5/8 | 2.90 | 9/16 | 1 1/4 | 9 |
| 21/32 | 3.00 | 9/16 | 1 1/4 | 9 |
| 11/16 | 3.15 | 9/16 | 1 1/4 | 9 |
| 23/32 | 3.30 | 9/16 | 1 1/4 | 9 |
| 3/4 | 3.45 | 5/8 | 1 3/8 | 9 1/2 |
| 25/32 | 3.60 | 5/8 | 1 3/8 | 9 1/2 |
| 13/16 | 3.80 | 5/8 | 1 3/8 | 9 1/2 |
| 27/32 | 4.00 | 5/8 | 1 3/8 | 9 1/2 |
| 7/8 | 4.25 | 3/4 | 1 1/2 | 10 |
| 29/32 | 4.50 | 3/4 | 1 1/2 | 10 |
| 15/16 | 4.75 | 3/4 | 1 1/2 | 10 |
| 31/32 | 5.00 | 3/4 | 1 1/2 | 10 |
| 1" | 5.20 | 7/8 | 1 5/8 | 10 1/2 |
| 1 1/16 | 5.50 | 7/8 | 1 5/8 | 10 1/2 |
| 1 1/8 | 5.85 | 7/8 | 1 3/4 | 11 |
| 1 3/16 | 6.20 | 1 | 1 3/4 | 11 |
| 1 1/4 | 6.60 | 1 | 1 7/8 | 11 1/2 |
| 1 5/16 | 6.85 | 1 | 1 7/8 | 11 1/2 |
| 1 3/8 | 7.20 | 1 | 2 | 12 |
| 1 7/16 | 7.55 | 1 1/4 | 2 | 12 |
| 1 1/2 | 7.90 | 1 1/4 | 2 1/8 | 12 1/2 |

We can furnish these Reamers in millimeter sizes when desired.

*Always Give List Number When Ordering*

# Adjusting Wrenches for "Peerless" Expansion Chucking Reamers

### List Nos. 504 and 516

## "Peerless" Expansion Core Reamers

### List Nos. 510 and 518

---

## Adjusting Wrench

### List No. 537

**Code Word—LOVEWRATH**

**(Illustration of this wrench will be found on page 125 under the title of "Screw Wrench")**

| Size Hexagon on Wrench | Price Each | Fitting Sizes of Chucking Reamers List Nos. 504 & 516 | Fitting Sizes of Core Reamers List Nos. 510 & 518 |
|---|---|---|---|
| 1/8 | .12 | 3/4 to 29/32 | 7/8 to 1 3/32 |
| 3/16 | .12 | 15/16 to 1 9/32 | 1 1/8 to 1 15/32 |
| 1/4 | .14 | 1 5/16 to 1 21/32 | 1 1/2 to 1 29/32 |
| 5/16 | .16 | 1 11/16 to 1 29/32 | 1 15/16 to 2 1/8 |
| 3/8 | .20 | 1 15/16 to 2 3/8 | 2 5/32 to 2 11/16 |
| 1/2 | .38 | 2 13/32 to 3 | 2 23/32 to 3 7/16 |

For Chucking Reamers smaller than those listed above, these wrenches are not necessary, as the expansion pin is provided with a screw driver slot. For Chucking and Core Reamers larger than those listed above, the expansion pin is provided with a flatted head and may be adjusted with an open end wrench

***Always Give List Number When Ordering***

# PEERLESS HIGH SPEED REAMERS

TRADE MARK REG. U.S. PAT. OFF.

## "Peerless" Straight Shank Expansion Chucking Reamers

### List No. 504

**Code Word—LOANED**

| Diameter Inches | Price Each | Diameter of Shank Inches | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|---|
| 1/2 | $4.25 | 7/16 | 1 | 8 |
| 17/32 | 4.40 | 7/16 | 1 | 8 |
| 9/16 | 4.50 | 7/16 | 1 1/8 | 8 |
| 19/32 | 4.65 | 7/16 | 1 1/8 | 8 |
| 5/8 | 4.75 | 9/16 | 1 1/4 | 9 |
| 21/32 | 4.90 | 9/16 | 1 1/4 | 9 |
| 11/16 | 5.00 | 9/16 | 1 1/4 | 9 |
| 23/32 | 5.25 | 9/16 | 1 1/4 | 9 |
| 3/4 | 5.50 | 5/8 | 1 3/8 | 9 1/2 |
| 25/32 | 5.75 | 5/8 | 1 3/8 | 9 1/2 |
| 13/16 | 6.00 | 5/8 | 1 3/8 | 9 1/2 |
| 27/32 | 6.25 | 5/8 | 1 3/8 | 9 1/2 |
| 7/8 | 6.50 | 3/4 | 1 1/2 | 10 |
| 29/32 | 6.80 | 3/4 | 1 1/2 | 10 |
| 15/16 | 7.10 | 3/4 | 1 1/2 | 10 |
| 31/32 | 7.40 | 3/4 | 1 1/2 | 10 |
| 1" | 7.80 | 7/8 | 1 5/8 | 10 1/2 |
| 1 1/32 | 8.20 | 7/8 | 1 5/8 | 10 1/2 |
| 1 1/16 | 8.60 | 7/8 | 1 5/8 | 10 1/2 |
| 1 3/32 | 9.00 | 7/8 | 1 5/8 | 10 1/2 |
| 1 1/8 | 9.40 | 7/8 | 1 3/4 | 11 |
| 1 5/32 | 9.70 | 7/8 | 1 3/4 | 11 |
| 1 3/16 | 10.00 | 1 | 1 3/4 | 11 |
| 1 7/32 | 10.30 | 1 | 1 3/4 | 11 |
| 1 1/4 | 10.70 | 1 | 1 7/8 | 11 1/2 |
| 1 5/16 | 11.10 | 1 | 1 7/8 | 11 1/2 |
| 1 3/8 | 11.50 | 1 | 2 | 12 |

**Continued on next page**

"Peerless" Expansion Reamers are not intended to ream smaller than size stamped on body.

The expansive feature is designed to maintain the initial size by compensating for wear at the cutting end.

*Always Give List Number When Ordering*

# PEERLESS HIGH SPEED REAMERS

TRADE MARK REG. U.S. PAT. OFF.

## "Peerless" Straight Shank Expansion Chucking Reamers

### List No. 504

Code Word—LOANED

| Diameter Inches | Price Each | Diameter of Shank Inches | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|---|
| 1 7/16 | $12.00 | 1¼ | 2 | 12 |
| 1½ | 12.50 | 1¼ | 2⅛ | 12½ |
| 1 9/16 | 13.10 | 1¼ | 2⅛ | 12½ |
| 1⅝ | 13.70 | 1¼ | 2¼ | 13 |
| 1 11/16 | 14.30 | 1¼ | 2¼ | 13 |
| 1¾ | 15.00 | 1¼ | 2⅜ | 13½ |
| 1 13/16 | 15.70 | 1½ | 2⅜ | 13½ |
| 1⅞ | 16.40 | 1½ | 2½ | 14 |
| 1 15/16 | 17.20 | 1½ | 2½ | 14 |
| 2″ | 18.00 | 1½ | 2½ | 14 |
| 2 1/16 | 18.80 | 1½ | 2¾ | 14½ |
| 2⅛ | 19.70 | 1½ | 2¾ | 14½ |
| 2 3/16 | 21.60 | 1¾ | 2¾ | 14½ |
| 2¼ | 22.50 | 1¾ | 2¾ | 14½ |
| 2 5/16 | 23.40 | 1¾ | 3 | 15 |
| 2⅜ | 24.40 | 1¾ | 3 | 15 |
| 2 7/16 | 25.50 | 1¾ | 3 | 15 |
| 2½ | 26.60 | 1¾ | 3 | 15 |
| 2 9/16 | 27.80 | 2 | 3¼ | 15½ |
| 2⅝ | 29.00 | 2 | 3¼ | 15½ |
| 2 11/16 | 30.20 | 2 | 3¼ | 15½ |
| 2¾ | 31.50 | 2 | 3¼ | 15½ |
| 2 13/16 | 32.80 | 2 | 3½ | 16 |
| 2⅞ | 34.20 | 2 | 3½ | 16 |
| 2 15/16 | 35.70 | 2 | 3½ | 16 |
| 3″ | 37.30 | 2 | 3½ | 16 |

"Peerless" Expansion Reamers are not intended to ream smaller than size stamped on body.

The expansive feature is designed to maintain the initial size by compensating for wear at the cutting end.

*Always Give List Number When Ordering*

# PEERLESS HIGH SPEED REAMERS

TRADE MARK REG. U.S. PAT. OFF.

## "Peerless" Straight Shank Core Reamers

### List No. 509

Code Word—LOCALE

| Diameter Inches | Price Each | Diameter of Shank Inches | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|---|
| 5/8 | $2.90 | 9/16 | 1 1/4 | 9 |
| 21/32 | 3.00 | 9/16 | 1 1/4 | 9 |
| 11/16 | 3.15 | 9/16 | 1 1/4 | 9 |
| 23/32 | 3.30 | 9/16 | 1 1/4 | 9 |
| 3/4 | 3.45 | 5/8 | 1 3/8 | 9 1/2 |
| 25/32 | 3.60 | 5/8 | 1 3/8 | 9 1/2 |
| 13/16 | 3.80 | 5/8 | 1 3/8 | 9 1/2 |
| 27/32 | 4.00 | 5/8 | 1 3/8 | 9 1/2 |
| 7/8 | 4.25 | 3/4 | 1 1/2 | 10 |
| 29/32 | 4.50 | 3/4 | 1 1/2 | 10 |
| 15/16 | 4.75 | 3/4 | 1 1/2 | 10 |
| 31/32 | 5.00 | 3/4 | 1 1/2 | 10 |
| 1" | 5.20 | 7/8 | 1 5/8 | 10 1/2 |
| 1 1/16 | 5.50 | 7/8 | 1 5/8 | 10 1/2 |
| 1 1/8 | 5.85 | 7/8 | 1 3/4 | 11 |
| 1 3/16 | 6.20 | 1 | 1 3/4 | 11 |
| 1 1/4 | 6.60 | 1 | 1 7/8 | 11 1/2 |
| 1 5/16 | 6.85 | 1 | 1 7/8 | 11 1/2 |
| 1 3/8 | 7.20 | 1 | 2 | 12 |
| 1 7/16 | 7.55 | 1 1/4 | 2 | 12 |
| 1 1/2 | 7.90 | 1 1/4 | 2 1/8 | 12 1/2 |

"Peerless" Core Reamers, for rough boring cored or drilled holes, have heavy flutes and deep grooves. They may be end ground until entirely used up. To insure a perfectly finished hole, they should be followed with a finishing reamer

*Always Give List Number When Ordering*

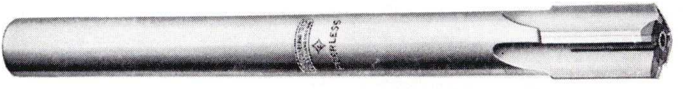
## PEERLESS HIGH SPEED REAMERS

TRADE MARK REG. U.S. PAT. OFF.

# "Peerless" Straight Shank Expansion Core Reamers

## List No. 510

**Code Word—LOCKER**



| Diameter Inches | Price Each | Diam. of Shank Inches | Length of Flute Inches | Length Overall Inches | Diameter Inches | Price Each | Diam. of Shank Inches | Length of Flute Inches | Length Overall Inches |
|---|---|---|---|---|---|---|---|---|---|
| 7/8 | $6.50 | 3/4 | 1 1/2 | 10 | 1 13/16 | $15.70 | 1 1/2 | 2 3/8 | 13 1/2 |
| 29/32 | 6.80 | 3/4 | 1 1/2 | 10 | 1 7/8 | 16.40 | 1 1/2 | 2 1/2 | 14 |
| 15/16 | 7.10 | 3/4 | 1 1/2 | 10 | 1 15/16 | 17.20 | 1 1/2 | 2 1/2 | 14 |
| 31/32 | 7.40 | 3/4 | 1 1/2 | 10 | 2" | 18.00 | 1 1/2 | 2 1/2 | 14 |
| 1" | 7.80 | 7/8 | 1 5/8 | 10 1/2 | 2 1/16 | 18.80 | 1 1/2 | 2 3/4 | 14 1/2 |
| 1 1/32 | 8.20 | 7/8 | 1 5/8 | 10 1/2 | 2 1/8 | 19.70 | 1 1/2 | 2 3/4 | 14 1/2 |
| 1 1/16 | 8.60 | 7/8 | 1 5/8 | 10 1/2 | 2 3/16 | 21.60 | 1 3/4 | 2 3/4 | 14 1/2 |
| 1 3/32 | 9.00 | 7/8 | 1 5/8 | 10 1/2 | 2 1/4 | 22.50 | 1 3/4 | 2 3/4 | 14 1/2 |
| 1 1/8 | 9.40 | 7/8 | 1 3/4 | 11 | 2 5/16 | 23.40 | 1 3/4 | 3 | 15 |
| 1 5/32 | 9.70 | 7/8 | 1 3/4 | 11 | 2 3/8 | 24.40 | 1 3/4 | 3 | 15 |
| 1 3/16 | 10.00 | 1 | 1 3/4 | 11 | 2 7/16 | 25.50 | 1 3/4 | 3 | 15 |
| 1 7/32 | 10.30 | 1 | 1 3/4 | 11 | 2 1/2 | 26.60 | 1 3/4 | 3 | 15 |
| 1 1/4 | 10.70 | 1 | 1 7/8 | 11 1/2 | 2 9/16 | 27.80 | 2 | 3 1/4 | 15 1/2 |
| 1 5/16 | 11.10 | 1 | 1 7/8 | 11 1/2 | 2 5/8 | 29.00 | 2 | 3 1/4 | 15 1/2 |
| 1 3/8 | 11.50 | 1 | 2 | 12 | 2 11/16 | 30.20 | 2 | 3 1/4 | 15 1/2 |
| 1 7/16 | 12.00 | 1 1/4 | 2 | 12 | 2 3/4 | 31.50 | 2 | 3 1/4 | 15 1/2 |
| 1 1/2 | 12.50 | 1 1/4 | 2 1/8 | 12 1/2 | 2 13/16 | 32.80 | 2 | 3 1/2 | 16 |
| 1 9/16 | 13.10 | 1 1/4 | 2 1/8 | 12 1/2 | 2 7/8 | 34.20 | 2 | 3 1/2 | 16 |
| 1 5/8 | 13.70 | 1 1/4 | 2 1/4 | 13 | 2 15/16 | 35.70 | 2 | 3 1/2 | 16 |
| 1 11/16 | 14.30 | 1 1/4 | 2 1/4 | 13 | 3" | 37.30 | 2 | 3 1/2 | 16 |
| 1 3/4 | 15.00 | 1 1/4 | 2 3/8 | 13 1/2 | | | | | |

"Peerless" Expansion Reamers are not intended to ream smaller than size stamped on body.

The expansive feature is designed to maintain the initial size by compensating for wear at the cutting end.

*Always Give List Number When Ordering*

# PEERLESS HIGH SPEED REAMERS

TRADE MARK REG. U.S. PAT. OFF.

## "Peerless" Taper Shank Chucking Reamers

### List No. 515

**Code Word—LOGWOOD**

| Diameter Inches | Price Each | Length of Flute Inches | Length Overall Inches | Shank Taper |
|---|---|---|---|---|
| 1/2 | $2.70 | 1 | 8 | No. 2 |
| 17/32 | 2.80 | 1 | 8 | |
| 9/16 | 2.90 | 1 1/8 | 8 | |
| 19/32 | 3.00 | 1 1/8 | 8 | |
| 5/8 | 3.10 | 1 1/4 | 9 | |
| 21/32 | 3.20 | 1 1/4 | 9 | |
| 11/16 | 3.30 | 1 1/4 | 9 | |
| 23/32 | 3.50 | 1 1/4 | 9 | |
| 3/4 | 3.70 | 1 3/8 | 9 1/2 | No. 3 |
| 25/32 | 3.90 | 1 3/8 | 9 1/2 | |
| 13/16 | 4.10 | 1 3/8 | 9 1/2 | |
| 27/32 | 4.30 | 1 3/8 | 9 1/2 | |
| 7/8 | 4.50 | 1 1/2 | 10 | |
| 29/32 | 4.75 | 1 1/2 | 10 | |
| 15/16 | 5.00 | 1 1/2 | 10 | |
| 31/32 | 5.25 | 1 1/2 | 10 | |
| 1" | 5.50 | 1 5/8 | 10 1/2 | |
| 1 1/16 | 6.00 | 1 5/8 | 10 1/2 | |
| 1 1/8 | 6.50 | 1 3/4 | 11 | No. 4 |
| 1 3/16 | 7.00 | 1 3/4 | 11 | |
| 1 1/4 | 7.60 | 1 7/8 | 11 1/2 | |
| 1 5/16 | 7.90 | 1 7/8 | 11 1/2 | |
| 1 3/8 | 8.20 | 2 | 12 | |
| 1 7/16 | 8.60 | 2 | 12 | |
| 1 1/2 | 9.00 | 2 1/8 | 12 1/2 | |

*Always Give List Number When Ordering*

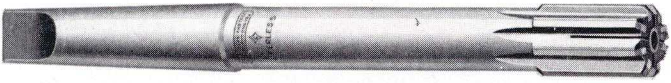
# PEERLESS HIGH SPEED REAMERS

TRADE MARK REG. U.S. PAT. OFF.

## "Peerless" Taper Shank Expansion Chucking Reamers

### List No. 516

**Code Word—LOOP**



| Diameter Inches | Price Each | Length of Flute Inches | Length Over-all Inches | Shank Taper | Diameter Inches | Price Each | Length of Flute Inches | Length Over-all Inches | Shank Taper |
|---|---|---|---|---|---|---|---|---|---|
| 1/2 | $4.75 | 1 | 8 | No. 2 | 1 3/8 | $12.50 | 2 | 12 | No. 4 |
| 17/32 | 4.90 | 1 | 8 | | 1 7/16 | 13.10 | 2 | 12 | |
| 9/16 | 5.00 | 1 1/8 | 8 | | 1 1/2 | 13.60 | 2 1/8 | 12 1/2 | |
| 19/32 | 5.15 | 1 1/8 | 8 | | 1 9/16 | 14.20 | 2 1/8 | 12 1/2 | |
| 5/8 | 5.25 | 1 1/4 | 9 | | 1 5/8 | 14.85 | 2 1/4 | 13 | |
| 21/32 | 5.40 | 1 1/4 | 9 | | 1 11/16 | 15.50 | 2 1/4 | 13 | |
| 11/16 | 5.50 | 1 1/4 | 9 | | 1 3/4 | 16.30 | 2 3/8 | 13 1/2 | No. 5 |
| 23/32 | 5.75 | 1 1/4 | 9 | | 1 13/16 | 17.10 | 2 3/8 | 13 1/2 | |
| 3/4 | 6.00 | 1 3/8 | 9 1/2 | No. 3 | 1 7/8 | 18.00 | 2 1/2 | 14 | |
| 25/32 | 6.20 | 1 3/8 | 9 1/2 | | 1 15/16 | 18.90 | 2 1/2 | 14 | |
| 13/16 | 6.40 | 1 3/8 | 9 1/2 | | 2" | 19.80 | 2 1/2 | 14 | |
| 27/32 | 6.70 | 1 3/8 | 9 1/2 | | 2 1/16 | 20.70 | 2 3/4 | 14 1/2 | |
| 7/8 | 7.00 | 1 1/2 | 10 | | 2 1/8 | 21.60 | 2 3/4 | 14 1/2 | |
| 29/32 | 7.30 | 1 1/2 | 10 | | 2 3/16 | 23.50 | 2 3/4 | 14 1/2 | |
| 15/16 | 7.60 | 1 1/2 | 10 | | 2 1/4 | 24.50 | 2 3/4 | 14 1/2 | |
| 31/32 | 7.90 | 1 1/2 | 10 | | 2 5/16 | 25.60 | 3 | 15 | |
| 1" | 8.30 | 1 5/8 | 10 1/2 | | 2 3/8 | 26.75 | 3 | 15 | |
| 1 1/32 | 8.60 | 1 5/8 | 10 1/2 | | 2 7/16 | 28.00 | 3 | 15 | |
| 1 1/16 | 9.00 | 1 5/8 | 10 1/2 | | 2 1/2 | 29.30 | 3 | 15 | |
| 1 3/32 | 9.40 | 1 5/8 | 10 1/2 | | 2 9/16 | 30.75 | 3 1/4 | 15 1/2 | |
| 1 1/8 | 9.80 | 1 3/4 | 11 | No. 4 | 2 5/8 | 32.25 | 3 1/4 | 15 1/2 | |
| 1 5/32 | 10.20 | 1 3/4 | 11 | | 2 11/16 | 33.80 | 3 1/4 | 15 1/2 | |
| 1 3/16 | 10.60 | 1 3/4 | 11 | | 2 3/4 | 35.40 | 3 1/4 | 15 1/2 | |
| 1 7/32 | 11.00 | 1 3/4 | 11 | | 2 13/16 | 37.00 | 3 1/2 | 16 | |
| 1 1/4 | 11.50 | 1 7/8 | 11 1/2 | | 2 7/8 | 38.70 | 3 1/2 | 16 | |
| 1 5/16 | 12.00 | 1 7/8 | 11 1/2 | | 2 15/16 | 40.50 | 3 1/2 | 16 | |
| | | | | | 3" | 42.50 | 3 1/2 | 16 | |

The Expansion of this Reamer is primarily for maintaining the size at the point where it wears in use.

It is not intended to ream smaller than the size stamped on the shank.

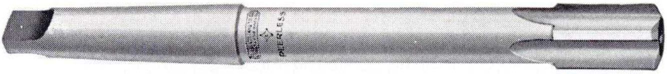
*Always Give List Number When Ordering*

PEERLESS HIGH SPEED REAMERS
TRADE MARK REG. U.S. PAT. OFF.

# "Peerless" Taper Shank Core Reamers

## List No. 517

Code Word—LOOPHOLE



| Diameter Inches | Price Each | Length of Flute Inches | Length Overall Inches | Shank Taper |
|---|---|---|---|---|
| 5/8 | $3.10 | 1 1/4 | 9 | No. 2 |
| 21/32 | 3.20 | 1 1/4 | 9 | |
| 11/16 | 3.30 | 1 1/4 | 9 | |
| 23/32 | 3.50 | 1 1/4 | 9 | |
| 3/4 | 3.70 | 1 3/8 | 9 1/2 | No. 3 |
| 25/32 | 3.90 | 1 3/8 | 9 1/2 | |
| 13/16 | 4.10 | 1 3/8 | 9 1/2 | |
| 27/32 | 4.30 | 1 3/8 | 9 1/2 | |
| 7/8 | 4.50 | 1 1/2 | 10 | |
| 29/32 | 4.75 | 1 1/2 | 10 | |
| 15/16 | 5.00 | 1 1/2 | 10 | |
| 31/32 | 5.25 | 1 1/2 | 10 | |
| 1″ | 5.50 | 1 5/8 | 10 1/2 | |
| 1 1/16 | 6.00 | 1 5/8 | 10 1/2 | |
| 1 1/8 | 6.50 | 1 3/4 | 11 | No. 4 |
| 1 3/16 | 7.00 | 1 3/4 | 11 | |
| 1 1/4 | 7.60 | 1 7/8 | 11 1/2 | |
| 1 5/16 | 7.90 | 1 7/8 | 11 1/2 | |
| 1 3/8 | 8.20 | 2 | 12 | |
| 1 7/16 | 8.60 | 2 | 12 | |
| 1 1/2 | 9.00 | 2 1/8 | 12 1/2 | |

Core Reamers are particularly adapted for enlarging cored holes or where only the roughing out of holes is required.

To get a smooth hole it is always well to follow with a finishing Reamer.

*Always Give List Number When Ordering*

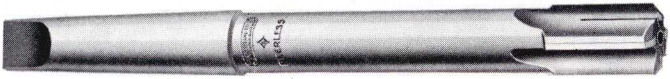
# PEERLESS HIGH SPEED REAMERS

TRADE MARK REG. U.S. PAT. OFF.

## "Peerless" Taper Shank Expansion Core Reamers

### List No. 518

**Code Word—LOTION**



| Diameter Inches | Price Each | Length of Flute Inches | Length Over-all Inches | Shank Taper | Diameter Inches | Price Each | Length of Flute Inches | Length Over-all Inches | Shank Taper |
|---|---|---|---|---|---|---|---|---|---|
| 7/8 | $7.00 | 1 1/2 | 10 | No. 3 | 1 3/4 | $16.30 | 2 3/8 | 13 1/2 | No. 5 |
| 29/32 | 7.30 | 1 1/2 | 10 | | 1 13/16 | 17.10 | 2 3/8 | 13 1/2 | |
| 15/16 | 7.60 | 1 1/2 | 10 | | 1 7/8 | 18.00 | 2 1/2 | 14 | |
| 31/32 | 7.90 | 1 1/2 | 10 | | 1 15/16 | 18.90 | 2 1/2 | 14 | |
| 1" | 8.30 | 1 5/8 | 10 1/2 | | 2" | 19.80 | 2 1/2 | 14 | |
| 1 1/32 | 8.60 | 1 5/8 | 10 1/2 | | 2 1/16 | 20.70 | 2 3/4 | 14 1/2 | |
| 1 1/16 | 9.00 | 1 5/8 | 10 1/2 | | 2 1/8 | 21.60 | 2 3/4 | 14 1/2 | |
| 1 3/32 | 9.40 | 1 5/8 | 10 1/2 | | 2 3/16 | 23.50 | 2 3/4 | 14 1/2 | |
| 1 1/8 | 9.80 | 1 3/4 | 11 | No. 4 | 2 1/4 | 24.50 | 2 3/4 | 14 1/2 | |
| 1 5/32 | 10.20 | 1 3/4 | 11 | | 2 5/16 | 25.60 | 3 | 15 | |
| 1 3/16 | 10.60 | 1 3/4 | 11 | | 2 3/8 | 26.75 | 3 | 15 | |
| 1 7/32 | 11.00 | 1 3/4 | 11 | | 2 7/16 | 28.00 | 3 | 15 | |
| 1 1/4 | 11.50 | 1 7/8 | 11 1/2 | | 2 1/2 | 29.30 | 3 | 15 | |
| 1 5/16 | 12.00 | 1 7/8 | 11 1/2 | | 2 9/16 | 30.75 | 3 1/4 | 15 1/2 | |
| 1 3/8 | 12.50 | 2 | 12 | | 2 5/8 | 32.25 | 3 1/4 | 15 1/2 | |
| 1 7/16 | 13.10 | 2 | 12 | | 2 11/16 | 33.80 | 3 1/4 | 15 1/2 | |
| 1 1/2 | 13.60 | 2 1/8 | 12 1/2 | | 2 3/4 | 35.40 | 3 1/4 | 15 1/2 | |
| 1 9/16 | 14.20 | 2 1/8 | 12 1/2 | | 2 13/16 | 37.00 | 3 1/2 | 16 | |
| 1 5/8 | 14.85 | 2 1/4 | 13 | | 2 7/8 | 38.70 | 3 1/2 | 16 | |
| 1 11/16 | 15.50 | 2 1/4 | 13 | | 2 15/16 | 40.50 | 3 1/2 | 16 | |
| | | | | | 3" | 42.50 | 3 1/2 | 16 | |

The Expansion of this Reamer is primarily intended to take up the wear at the end where the cutting is done.

The Reamer will be found especially serviceable for enlarging cored holes and where only the roughing out of holes is required.

*Always Give List Number When Ordering*

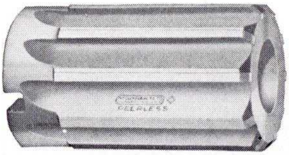
# PEERLESS HIGH SPEED REAMERS

TRADE MARK REG. U.S. PAT. OFF.

## "Peerless" Shell Reamers

### List No. 519

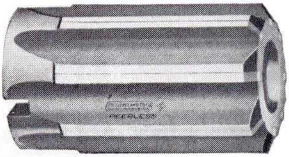
**Code Word—LOTTERY**



## "Peerless" Shell Core Reamers

### List No. 521

**Code Word—LOVED**



**Note: No. 521 not made smaller than $1\frac{3}{16}$-inch**

| Diameter Inches | Price Each | Size Hole Inches | Length Over-all Inches | Fitting Arbor |
|---|---|---|---|---|
| $\frac{7}{8}$ | $2.50 | $\frac{1}{2}$ | $2\frac{1}{2}$ | No. 5 |
| $\frac{15}{16}$ | 2.65 | $\frac{1}{2}$ | $2\frac{1}{2}$ | |
| 1″ | 2.80 | $\frac{1}{2}$ | $2\frac{1}{2}$ | |
| $1\frac{1}{16}$ | 3.00 | $\frac{5}{8}$ | $2\frac{3}{4}$ | No. 6 |
| $1\frac{1}{8}$ | 3.20 | $\frac{5}{8}$ | $2\frac{3}{4}$ | |
| $1\frac{3}{16}$ | 3.40 | $\frac{5}{8}$ | $2\frac{3}{4}$ | |
| $1\frac{1}{4}$ | 3.60 | $\frac{5}{8}$ | $2\frac{3}{4}$ | |
| $1\frac{5}{16}$ | 3.80 | $\frac{3}{4}$ | 3 | No. 7 |
| $1\frac{3}{8}$ | 4.00 | $\frac{3}{4}$ | 3 | |
| $1\frac{7}{16}$ | 4.20 | $\frac{3}{4}$ | 3 | |
| $1\frac{1}{2}$ | 4.50 | $\frac{3}{4}$ | 3 | |
| $1\frac{9}{16}$ | 4.80 | $\frac{3}{4}$ | 3 | |
| $1\frac{5}{8}$ | 5.10 | $\frac{3}{4}$ | 3 | |
| $1\frac{11}{16}$ | 5.50 | 1 | $3\frac{1}{2}$ | No. 8 |
| $1\frac{3}{4}$ | 5.90 | 1 | $3\frac{1}{2}$ | |
| $1\frac{13}{16}$ | 6.30 | 1 | $3\frac{1}{2}$ | |
| $1\frac{7}{8}$ | 6.70 | 1 | $3\frac{1}{2}$ | |
| $1\frac{15}{16}$ | 7.10 | 1 | $3\frac{1}{2}$ | |
| 2″ | 7.50 | 1 | $3\frac{1}{2}$ | |

| Diameter Inches | Price Each | Size Hole Inches | Length Over-all Inches | Fitting Arbor |
|---|---|---|---|---|
| $2\frac{1}{16}$ | $8.00 | $1\frac{1}{4}$ | $3\frac{3}{4}$ | No. 9 |
| $2\frac{1}{8}$ | 8.50 | $1\frac{1}{4}$ | $3\frac{3}{4}$ | |
| $2\frac{3}{16}$ | 9.00 | $1\frac{1}{4}$ | $3\frac{3}{4}$ | |
| $2\frac{1}{4}$ | 9.50 | $1\frac{1}{4}$ | $3\frac{3}{4}$ | |
| $2\frac{5}{16}$ | 10.00 | $1\frac{1}{4}$ | $3\frac{3}{4}$ | |
| $2\frac{3}{8}$ | 10.50 | $1\frac{1}{4}$ | $3\frac{3}{4}$ | |
| $2\frac{7}{16}$ | 11.00 | $1\frac{1}{4}$ | $3\frac{3}{4}$ | |
| $2\frac{1}{2}$ | 11.50 | $1\frac{1}{4}$ | $3\frac{3}{4}$ | |
| $2\frac{9}{16}$ | 12.00 | $1\frac{1}{2}$ | 4 | No. 10 |
| $2\frac{5}{8}$ | 12.75 | $1\frac{1}{2}$ | 4 | |
| $2\frac{11}{16}$ | 13.50 | $1\frac{1}{2}$ | 4 | |
| $2\frac{3}{4}$ | 14.25 | $1\frac{1}{2}$ | 4 | |
| $2\frac{13}{16}$ | 15.00 | $1\frac{1}{2}$ | 4 | |
| $2\frac{7}{8}$ | 15.75 | $1\frac{1}{2}$ | 4 | |
| $2\frac{15}{16}$ | 16.50 | $1\frac{1}{2}$ | 4 | |
| 3″ | 17.25 | $1\frac{1}{2}$ | 4 | |

These Reamers fit regular Arbors—See page 112.

Shell Reamers have taper holes, the diameter given being at the large end.

***Always Give List Number When Ordering***

# Straight Shank Arbors for "Peerless" Shell Reamers

## List No. 532

**Code Word—LOVESET**

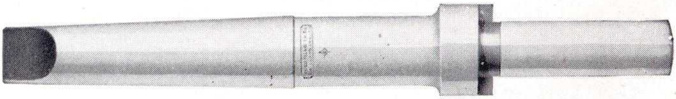
| Size No. | Price Each | Fitting Sizes "Peerless" Shell Reamers Inches | Length Overall Inches | Diameter of Shank Inches |
|---|---|---|---|---|
| 5 | $3.00 | $\frac{7}{8}$ to $1\frac{1}{32}$ | $9\frac{1}{2}$ | $\frac{5}{8}$ |
| 6 | 3.30 | $1\frac{1}{16}$ to $1\frac{9}{32}$ | 10 | $\frac{3}{4}$ |
| 7 | 3.60 | $1\frac{5}{16}$ to $1\frac{21}{32}$ | 11 | $\frac{7}{8}$ |
| 8 | 4.00 | $1\frac{11}{16}$ to 2 | 12 | $1\frac{1}{8}$ |
| 9 | 4.50 | $2\frac{1}{16}$ to $2\frac{1}{2}$ | 13 | $1\frac{3}{8}$ |
| 10 | 5.25 | $2\frac{9}{16}$ to 3 | 14 | $1\frac{5}{8}$ |

These arbors are regular and identical with Arbor No. 133.

# Taper Shank Arbors for "Peerless" Shell Reamers

## List No. 533

**Code Word—LOVESICK**



| Size No. | Price Each | Fitting Sizes "Peerless" Shell Reamers Inches | Length Overall Inches | Shank Taper |
|---|---|---|---|---|
| 5 | $3.60 | $\frac{7}{8}$ to $1\frac{1}{32}$ | $9\frac{1}{2}$ | No. 2 |
| 6 | 3.95 | $1\frac{1}{16}$ to $1\frac{9}{32}$ | 10 | No. 3 |
| 7 | 4.30 | $1\frac{5}{16}$ to $1\frac{21}{32}$ | 11 | No. 4 |
| 8 | 4.80 | $1\frac{11}{16}$ to 2 | 12 | |
| 9 | 5.40 | $2\frac{1}{16}$ to $2\frac{1}{2}$ | 13 | No. 5 |
| 10 | 6.30 | $2\frac{9}{16}$ to 3 | 14 | |

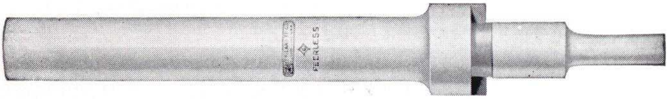
These arbors are regular except that they have extra large taper shanks to stand high speed cuts.

***Always Give List Number When Ordering***

# Straight Shank Arbors for "Peerless" Expansion Shell Reamers

## List No. 535

**Code Word—LOVEWORTHY**



| Size No. | Price Each | Fitting Sizes "Peerless" Shell Reamers Inches | Length Overall Inches | Diameter of Shank Inches |
|---|---|---|---|---|
| 6 | $4.35 | $1\frac{1}{8}$ to $1\frac{9}{32}$ | 10 | $\frac{3}{4}$ |
| 7-A | 4.65 | $1\frac{5}{16}$ to $1\frac{7}{16}$ | 11 | $\frac{7}{8}$ |
| 7-B | 4.65 | $1\frac{1}{2}$ to $1\frac{21}{32}$ | 11 | $\frac{7}{8}$ |
| 8-A | 5.10 | $1\frac{11}{16}$ to $1\frac{13}{16}$ | 12 | $1\frac{1}{8}$ |
| 8-B | 5.10 | $1\frac{7}{8}$ to 2 | 12 | $1\frac{1}{8}$ |
| 9-A | 5.55 | $2\frac{1}{16}$ to $2\frac{3}{16}$ | 13 | $1\frac{3}{8}$ |
| 9-B | 5.55 | $2\frac{1}{4}$ to $2\frac{3}{8}$ | 13 | $1\frac{3}{8}$ |
| 9-C | 5.55 | $2\frac{7}{16}$ to $2\frac{1}{2}$ | 13 | $1\frac{3}{8}$ |
| 10 | 6.30 | $2\frac{9}{16}$ to 3 | 14 | $1\frac{5}{8}$ |

# Taper Shank Arbors for "Peerless" Expansion Shell Reamers

## List No. 536

**Code Word—LOVING**

| Size No. | Price Each | Fitting Sizes "Peerless" Shell Reamers Inches | Length Overall Inches | Shank Taper |
|---|---|---|---|---|
| 6 | $5.20 | $1\frac{1}{8}$ to $1\frac{9}{32}$ | 10 | No. 3 |
| 7-A | 5.60 | $1\frac{5}{16}$ to $1\frac{7}{16}$ | 11 | No. 4 |
| 7-B | 5.60 | $1\frac{1}{2}$ to $1\frac{21}{32}$ | 11 | |
| 8-A | 6.10 | $1\frac{11}{16}$ to $1\frac{13}{16}$ | 12 | |
| 8-B | 6.10 | $1\frac{7}{8}$ to 2 | 12 | |
| 9-A | 6.65 | $2\frac{1}{16}$ to $2\frac{3}{16}$ | 13 | No. 5 |
| 9-B | 6.65 | $2\frac{1}{4}$ to $2\frac{3}{8}$ | 13 | |
| 9-C | 6.65 | $2\frac{7}{16}$ to $2\frac{1}{2}$ | 13 | |
| 10 | 7.55 | $2\frac{9}{16}$ to 3 | 14 | |

These arbors are regular except that they have extra large taper shanks to stand high speed cuts.

*Always Give List Number When Ordering*

# PEERLESS HIGH SPEED REAMERS

TRADE MARK REG. U.S. PAT. OFF.

## "Peerless" Expansion Shell Reamers

### List No. 520

**Code Word—LOTTO**

| Diameter Inches | Price Each | Size Hole Inches | Length Overall Inches | Fitting Arbor |
|---|---|---|---|---|
| 1¼ | $5.70 | ⅝ | 2¾ | No. 6 |
| 1 5/16 | 6.20 | ¾ | 3 | No. 7-A |
| 1⅜ | 6.70 | ¾ | 3 | |
| 1 7/16 | 7.20 | ¾ | 3 | |
| 1½ | 7.80 | ¾ | 3 | No. 7-B |
| 1 9/16 | 8.40 | ¾ | 3 | |
| 1⅝ | 9.00 | ¾ | 3 | |
| 1 11/16 | 9.60 | 1 | 3½ | No. 8-A |
| 1¾ | 10.20 | 1 | 3½ | |
| 1 13/16 | 10.80 | 1 | 3½ | |
| 1⅞ | 11.40 | 1 | 3½ | No. 8-B |
| 1 15/16 | 12.00 | 1 | 3½ | |
| 2″ | 12.60 | 1 | 3½ | |

| Diameter Inches | Price Each | Size Hole Inches | Length Overall Inches | Fitting Arbor |
|---|---|---|---|---|
| 2 1/16 | $13.20 | 1¼ | 3¾ | No. 9-A |
| 2⅛ | 13.80 | 1¼ | 3¾ | |
| 2 3/16 | 14.50 | 1¼ | 3¾ | |
| 2¼ | 15.20 | 1¼ | 3¾ | No. 9-B |
| 2 5/16 | 15.90 | 1¼ | 3¾ | |
| 2⅜ | 16.60 | 1¼ | 3¾ | |
| 2 7/16 | 17.30 | 1¼ | 3¾ | No. 9-C |
| 2½ | 18.00 | 1¼ | 3¾ | |
| 2 9/16 | 18.75 | 1½ | 4 | No. 10 |
| 2⅝ | 19.50 | 1½ | 4 | |
| 2 11/16 | 20.50 | 1½ | 4 | |
| 2¾ | 21.50 | 1½ | 4 | |
| 2 13/16 | 22.50 | 1½ | 4 | |
| 2⅞ | 23.75 | 1½ | 4 | |
| 2 15/16 | 25.00 | 1½ | 4 | |
| 3″ | 26.25 | 1½ | 4 | |

These Reamers fit Special Arbors shown on page 113.

They are not intended to ream smaller than size stamped on body—the expansive feature is designed to maintain the initial size by compensating for wear.

Special Adjusting Wrenches, with prices, are shown on page 115.

***Always Give List Number When Ordering***

# Adjusting Wrenches for "Peerless" Expansion Shell Reamers

## List No. 534

**Code Word—LOVESOME**

| Size No. | Price Each | Fitting Sizes Inches | Length Overall Inches |
|---|---|---|---|
| 6 | $.40 | $1\frac{1}{8}$ to $1\frac{9}{32}$ | $1\frac{1}{2}$ |
| 7-A | .40 | $1\frac{5}{16}$ to $1\frac{7}{16}$ | $1\frac{1}{2}$ |
| 7-B | .45 | $1\frac{1}{2}$ to $1\frac{21}{32}$ | $1\frac{1}{2}$ |
| 8-A | .50 | $1\frac{11}{16}$ to $1\frac{13}{16}$ | $1\frac{5}{8}$ |
| 8-B | .55 | $1\frac{7}{8}$ to 2 | $1\frac{5}{8}$ |
| 9-A | .60 | $2\frac{1}{16}$ to $2\frac{3}{16}$ | 2 |
| 9-B | .70 | $2\frac{1}{4}$ to $2\frac{3}{8}$ | $2\frac{1}{8}$ |
| 9-C | .80 | $2\frac{7}{16}$ to $2\frac{1}{2}$ | $2\frac{1}{4}$ |
| 10 | .90 | $2\frac{9}{16}$ to 3 | $2\frac{1}{2}$ |

These Adjusting Wrenches are of special design for use with the Expansion Shell Reamers shown on page 114. The reamers must be removed from the arbors before adjusting. A flat bar of steel made a snug fit for the driving slot of the reamer should be gripped on edge in a vise, with enough left projecting to permit of the reamer being set on end upon it. This will prevent the reamer's turning when the wrench is inserted in the expanding plug. The reamer itself must not be gripped in the vise.

"Peerless" Expanding Shell Reamers may be adjusted in the machine by using a special arbor with a plug short enough to permit the insertion of the adjusting wrench. Such arbors will be furnished only to order, as adjustments made out of the tool room are generally unsatisfactory.

*Always Give List Number When Ordering*

DETROIT STOCKROOM • • ESTABLISHED DECEMBER 1, 1932 FOR THE PURPOSE OF SAVING A FEW HOURS' TIME IN SERVING DISTRIBUTORS AND CONSUMERS IN THE GREAT INDUSTRIAL AREA OF WHICH DETROIT IS THE CENTRE

# "CLEVELAND" HIGH SPEED ADJUSTABLE REAMERS

CLEVELAND
TWIST DRILLS
AND
REAMERS
TRADE MARK
The
Cleveland Twist Drill Co
CLE-FORGE HIGH SPEED DRILLS
Trinity 2-7060
THE
CLEVELAND TWIST DRILL
- CO -
CLE-FORGE HIGH SPEED DRILLS

THE
CLEVELAND TWIST DRILL
CO.
TRADE MARK

**FOR ALPHABETICAL INDEX, SEE PAGES 221-229**

**FOR NUMERICAL INDEX, SEE PAGES 230-240**

CLEVELAND

TRADE MARK REG. U. S. PAT. OFF. AND FOREIGN COUNTRIES

## High-Speed Adjustable Reamers

The Cleveland High Speed Adjustable Reamers, illustrated and listed in the following pages, present the following advantages:

**Simplicity and Quickness** These reamers are simple in design, with no unnecessary or complicated parts. They can, therefore, be easily and quickly adjusted to different sizes.

**Accuracy and Economy** An outstanding feature of these reamers is that the slots and blades are so accurately machined that the diameter can be expanded or contracted to larger or smaller sizes and, without regrinding, maintain concentricity within small limits.

When the blades have become dull, they can be expanded and reground, not once but many times, before they are worn out.

When a new set, or part of a set, of blades or screws is required, it can be furnished promptly from stock. The blades will be furnished with stock for grinding on the cutting edges. One reamer body may easily wear out several sets of blades during its life.

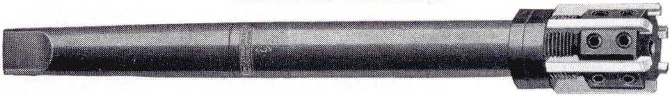
**Rigidity and Strength** Due to the method of clamping each blade by two screws and the adjusting nut, this type of reamer is practically as rigid as a solid tool. The body is designed to provide ample support and backing to the blades. The result is a rugged reamer capable of withstanding hard usage.

**Spiral Blades** These reamers can be furnished with either right or left hand spiral blades. However, due to the effect of the spiral, it is necessary to regrind spiral flute reamers after each adjustment.

# High Speed Taper Shank Adjustable Chucking Reamers

## List No. 608

**Code Word—LOWCOW**



**Patent No. 1,928,014**

| Diameter Inches | Price Each | Adjustment | Length Overall | Shank Taper |
|---|---|---|---|---|
| 1 | $14.25 | $\frac{1}{32}$ | $10\frac{1}{2}$ | No. 2 |
| $1\frac{1}{32}$ | 14.75 | $\frac{1}{32}$ | $10\frac{1}{2}$ | |
| $1\frac{1}{16}$ | 14.75 | $\frac{1}{32}$ | $10\frac{1}{2}$ | |
| $1\frac{3}{32}$ | 15.25 | $\frac{1}{32}$ | $10\frac{1}{2}$ | |
| $1\frac{1}{8}$ | 15.25 | $\frac{1}{32}$ | $10\frac{1}{2}$ | |
| $1\frac{5}{32}$ | 15.75 | $\frac{1}{32}$ | $10\frac{1}{2}$ | |
| $1\frac{3}{16}$ | 15.75 | $\frac{3}{32}$ | $10\frac{1}{2}$ | |
| $1\frac{1}{4}$ | 16.25 | $\frac{3}{32}$ | $10\frac{1}{2}$ | |
| $1\frac{5}{16}$ | 16.75 | $\frac{3}{32}$ | $10\frac{1}{2}$ | |
| $1\frac{3}{8}$ | 17.25 | $\frac{3}{32}$ | $10\frac{1}{2}$ | |
| $1\frac{7}{16}$ | 17.75 | $\frac{3}{32}$ | $11\frac{1}{2}$ | No. 3 |
| $1\frac{1}{2}$ | 18.25 | $\frac{3}{32}$ | $11\frac{1}{2}$ | |
| $1\frac{9}{16}$ | 19.00 | $\frac{3}{32}$ | $11\frac{1}{2}$ | |
| $1\frac{5}{8}$ | 19.75 | $\frac{3}{32}$ | $12\frac{1}{2}$ | |
| $1\frac{11}{16}$ | 20.50 | $\frac{3}{32}$ | $12\frac{1}{2}$ | |
| $1\frac{3}{4}$ | 21.25 | $\frac{7}{64}$ | $12\frac{1}{2}$ | |
| $1\frac{13}{16}$ | 22.00 | $\frac{7}{64}$ | $12\frac{1}{2}$ | |
| $1\frac{7}{8}$ | 22.75 | $\frac{7}{64}$ | $12\frac{1}{2}$ | |
| $1\frac{15}{16}$ | 23.50 | $\frac{7}{64}$ | $12\frac{1}{2}$ | |
| 2 | 24.25 | $\frac{7}{64}$ | 14 | No. 4 |
| $2\frac{1}{16}$ | 25.00 | $\frac{7}{64}$ | $14\frac{1}{2}$ | |
| $2\frac{1}{8}$ | 25.75 | $\frac{7}{64}$ | $14\frac{1}{2}$ | |
| $2\frac{3}{16}$ | 26.50 | $\frac{7}{64}$ | $14\frac{1}{2}$ | |
| $2\frac{1}{4}$ | 27.25 | $\frac{7}{64}$ | $14\frac{1}{2}$ | |
| $2\frac{5}{16}$ | 28.25 | $\frac{7}{64}$ | 15 | |
| $2\frac{3}{8}$ | 29.25 | $\frac{7}{64}$ | 15 | |
| $2\frac{7}{16}$ | 30.25 | $\frac{7}{64}$ | 15 | |
| $2\frac{1}{2}$ | 31.25 | $\frac{9}{64}$ | 15 | No. 5 |
| $2\frac{9}{16}$ | 32.25 | $\frac{9}{64}$ | $15\frac{1}{2}$ | |
| $2\frac{5}{8}$ | 33.25 | $\frac{9}{64}$ | $15\frac{1}{2}$ | |
| $2\frac{11}{16}$ | 34.25 | $\frac{9}{64}$ | $15\frac{1}{2}$ | |
| $2\frac{3}{4}$ | 35.25 | $\frac{9}{64}$ | $15\frac{1}{2}$ | |
| $2\frac{13}{16}$ | 36.50 | $\frac{9}{64}$ | 16 | |
| $2\frac{7}{8}$ | 37.75 | $\frac{9}{64}$ | 16 | |
| $2\frac{15}{16}$ | 39.00 | $\frac{9}{64}$ | 16 | |
| 3 | 40.25 | $\frac{11}{64}$ | 16 | |

If desired, these reamers can be obtained with either left or right-hand spiral blades. Be sure to specify if so wanted.

# High Speed Straight Shank Adjustable Chucking Reamers

## List No. 607

**Code Word—LOWCET**

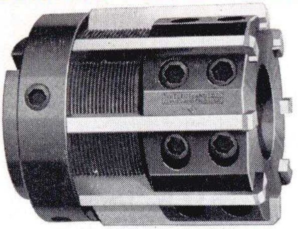
**Patent No. 1,928,014**

| Diameter Inches | Price Each | Diameter Straight Shank | Adjustment | Length Overall |
|---|---|---|---|---|
| 1 | $13.50 | 11/16 | 1/32 | 10½ |
| 1 1/32 | 14.00 | 11/16 | 1/32 | 10½ |
| 1 1/16 | 14.00 | 11/16 | 1/32 | 10½ |
| 1 3/32 | 14.50 | 11/16 | 1/32 | 10½ |
| 1⅛ | 14.50 | 11/16 | 1/32 | 10½ |
| 1 5/32 | 15.00 | 11/16 | 1/32 | 10½ |
| 1 3/16 | 15.00 | 11/16 | 3/32 | 10½ |
| 1¼ | 15.50 | ¾ | 3/32 | 10½ |
| 1 5/16 | 16.00 | ¾ | 3/32 | 10½ |
| 1⅜ | 16.50 | ¾ | 3/32 | 10½ |
| 1 7/16 | 17.00 | 15/16 | 3/32 | 11½ |
| 1½ | 17.50 | 15/16 | 3/32 | 11½ |
| 1 9/16 | 18.25 | 15/16 | 3/32 | 11½ |
| 1⅝ | 19.00 | 1 | 3/32 | 12½ |
| 1 11/16 | 19.75 | 1 | 3/32 | 12½ |
| 1¾ | 20.50 | 1⅛ | 7/64 | 12½ |
| 1 13/16 | 21.25 | 1⅛ | 7/64 | 12½ |
| 1⅞ | 22.00 | 1⅛ | 7/64 | 12½ |
| 1 15/16 | 22.75 | 1¼ | 7/64 | 12½ |
| 2 | 23.50 | 1¼ | 7/64 | 14 |
| 2 1/16 | 24.25 | 1¼ | 7/64 | 14½ |
| 2⅛ | 25.00 | 1¼ | 7/64 | 14½ |
| 2 3/16 | 25.75 | 1½ | 7/64 | 14½ |
| 2¼ | 26.50 | 1½ | 7/64 | 14½ |
| 2 5/16 | 27.25 | 1½ | 7/64 | 15 |
| 2⅜ | 28.00 | 1½ | 7/64 | 15 |
| 2 7/16 | 28.75 | 1¾ | 7/64 | 15 |
| 2½ | 29.50 | 1¾ | 9/64 | 15 |
| 2 9/16 | 30.50 | 1¾ | 9/64 | 15½ |
| 2⅝ | 31.50 | 1¾ | 9/64 | 15½ |
| 2 11/16 | 32.50 | 1¾ | 9/64 | 15½ |
| 2¾ | 33.50 | 1¾ | 9/64 | 15½ |
| 2 13/16 | 34.75 | 2 | 9/64 | 16 |
| 2⅞ | 36.00 | 2 | 9/64 | 16 |
| 2 15/16 | 37.25 | 2 | 9/64 | 16 |
| 3 | 38.50 | 2 | 11/64 | 16 |

If desired, these reamers can be obtained with either left or right-hand spiral blades. Be sure to specify if so wanted.

# High Speed Adjustable Shell Reamers

## List No. 606 Code Word—LOWCAB



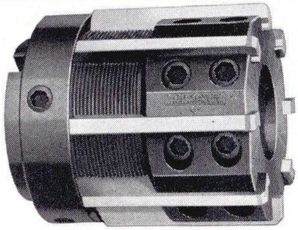
**Patent No. 1,928.014**

| Diameter Inches | Price Each | Adjustment | Fits Arbor No. | Dia. Hole at Large End | Length Overall |
|---|---|---|---|---|---|
| 1 3/8 | $15.00 | 3/32 | 5–7 | 1/2 | 2 1/2 |
| 1 7/16 | 15.50 | 3/32 | 5–7 | 1/2 | 2 1/2 |
| 1 1/2 | 16.00 | 3/32 | 5–7 | 1/2 | 2 1/2 |
| 1 9/16 | 16.50 | 3/32 | 5–7 | 1/2 | 2 1/2 |
| 1 5/8 | 17.00 | 3/32 | 5–7 | 1/2 | 2 1/2 |
| 1 11/16 | 17.50 | 3/32 | 5–7 | 1/2 | 2 1/2 |
| 1 3/4 | 18.00 | 7/64 | 6–7 1/2 | 5/8 | 2 3/4 |
| 1 13/16 | 18.50 | 7/64 | 6–7 1/2 | 5/8 | 2 3/4 |
| 1 7/8 | 19.00 | 7/64 | 6–7 1/2 | 5/8 | 2 3/4 |
| 1 15/16 | 19.50 | 7/64 | 6–7 1/2 | 5/8 | 2 3/4 |
| 2 | 20.00 | 7/64 | 7–8 | 3/4 | 3 |
| 2 1/16 | 20.75 | 7/64 | 7–8 | 3/4 | 3 |
| 2 1/8 | 21.50 | 7/64 | 7–8 | 3/4 | 3 |
| 2 3/16 | 22.25 | 7/64 | 7–8 | 3/4 | 3 |
| 2 1/4 | 23.00 | 7/64 | 7–8 | 3/4 | 3 |
| 2 5/16 | 23.75 | 7/64 | 7–8 | 3/4 | 3 |
| 2 3/8 | 24.50 | 7/64 | 7–8 | 3/4 | 3 |
| 2 7/16 | 25.25 | 7/64 | 7–8 | 3/4 | 3 |
| 2 1/2 | 26.00 | 9/64 | 8–9 | 1 | 3 1/2 |
| 2 9/16 | 26.75 | 9/64 | 8–9 | 1 | 3 1/2 |
| 2 5/8 | 27.50 | 9/64 | 8–9 | 1 | 3 1/2 |
| 2 11/16 | 28.25 | 9/64 | 8–9 | 1 | 3 1/2 |
| 2 3/4 | 29.00 | 9/64 | 8–9 | 1 | 3 1/2 |
| 2 13/16 | 29.75 | 9/64 | 8–9 | 1 | 3 1/2 |
| 2 7/8 | 30.50 | 9/64 | 8–9 | 1 | 3 1/2 |
| 2 15/16 | 31.25 | 9/64 | 8–9 | 1 | 3 1/2 |
| 3 | 32.00 | 11/64 | 9–10 | 1 1/4 | 3 3/4 |
| 3 1/16 | 33.00 | 11/64 | 9–10 | 1 1/4 | 3 3/4 |
| 3 1/8 | 34.00 | 11/64 | 9–10 | 1 1/4 | 3 3/4 |
| 3 3/16 | 35.00 | 11/64 | 9–10 | 1 1/4 | 3 3/4 |
| 3 1/4 | 36.00 | 11/64 | 9–10 | 1 1/4 | 3 3/4 |
| 3 5/16 | 37.00 | 11/64 | 9–10 | 1 1/4 | 3 3/4 |
| 3 3/8 | 38.00 | 3/16 | 10 | 1 1/2 | 4 |
| 3 7/16 | 39.00 | 3/16 | 10 | 1 1/2 | 4 |
| 3 1/2 | 40.00 | 3/16 | 10 | 1 1/2 | 4 |
| 3 9/16 | 41.00 | 3/16 | 10 | 1 1/2 | 4 |
| 3 5/8 | 42.00 | 3/16 | 10 | 1 1/2 | 4 |
| 3 11/16 | 43.00 | 3/16 | 10 | 1 1/2 | 4 |

If desired, these reamers can be obtained with either left or right-hand spiral blades. Be sure to specify if so wanted.

# High Speed Adjustable Shell Reamers

## List No. 606 Code Word—LOWCAB



Patent No. 1,928,014

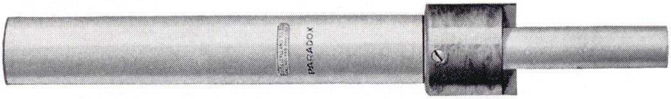
| Diameter Inches | Price Each | Adjustment | Fits Arbor No. | Dia. Hole at Large End | Length Overall |
|---|---|---|---|---|---|
| 3 3/4 | $44.00 | 3/16 | 10 | 1 1/2 | 4 |
| 3 13/16 | 45.25 | 3/16 | 10 | 1 1/2 | 4 |
| 3 7/8 | 46.50 | 3/16 | 10 | 1 1/2 | 4 |
| 3 15/16 | 47.75 | 3/16 | 10 | 1 1/2 | 4 |
| 4 | 49.00 | 7/32 | 11 | 1 3/4 | 4 1/2 |
| 4 1/16 | 50.50 | 7/32 | 11 | 1 3/4 | 4 1/2 |
| 4 1/8 | 52.00 | 7/32 | 11 | 1 3/4 | 4 1/2 |
| 4 3/16 | 53.50 | 7/32 | 11 | 1 3/4 | 4 1/2 |
| 4 1/4 | 55.00 | 7/32 | 11 | 1 3/4 | 4 1/2 |
| 4 5/16 | 56.50 | 7/32 | 11 | 1 3/4 | 4 1/2 |
| 4 3/8 | 58.00 | 7/32 | 11 | 1 3/4 | 4 1/2 |
| 4 7/16 | 59.50 | 7/32 | 11 | 1 3/4 | 4 1/2 |
| 4 1/2 | 61.00 | 7/32 | 12 | 2 | 5 |
| 4 9/16 | 62.75 | 7/32 | 12 | 2 | 5 |
| 4 5/8 | 64.50 | 7/32 | 12 | 2 | 5 |
| 4 11/16 | 66.25 | 7/32 | 12 | 2 | 5 |
| 4 3/4 | 68.00 | 7/32 | 12 | 2 | 5 |
| 4 13/16 | 69.75 | 7/32 | 12 | 2 | 5 |
| 4 7/8 | 71.50 | 7/32 | 12 | 2 | 5 |
| 4 15/16 | 73.25 | 7/32 | 12 | 2 | 5 |
| 5 | 75.00 | 7/32 | 12 | 2 | 5 |
| 5 1/16 | 76.75 | 7/32 | 12 | 2 | 5 |
| 5 1/8 | 78.50 | 7/32 | 12 | 2 | 5 |
| 5 3/16 | 80.25 | 7/32 | 12 | 2 | 5 |
| 5 1/4 | 82.00 | 17/64 | 13 | 2 1/4 | 5 1/2 |
| 5 5/16 | 83.75 | 17/64 | 13 | 2 1/4 | 5 1/2 |
| 5 3/8 | 85.50 | 17/64 | 13 | 2 1/4 | 5 1/2 |
| 5 7/16 | 87.25 | 17/64 | 13 | 2 1/4 | 5 1/2 |
| 5 1/2 | 89.00 | 17/64 | 13 | 2 1/4 | 5 1/2 |
| 5 9/16 | 91.00 | 17/64 | 13 | 2 1/4 | 5 1/2 |
| 5 5/8 | 93.00 | 17/64 | 13 | 2 1/4 | 5 1/2 |
| 5 11/16 | 95.00 | 17/64 | 13 | 2 1/4 | 5 1/2 |
| 5 3/4 | 97.00 | 17/64 | 13 | 2 1/4 | 5 1/2 |
| 5 13/16 | 99.00 | 17/64 | 13 | 2 1/4 | 5 1/2 |
| 5 7/8 | 101.00 | 17/64 | 13 | 2 1/4 | 5 1/2 |
| 5 15/16 | 103.00 | 17/64 | 13 | 2 1/4 | 5 1/2 |
| 6 | 105.00 | 17/64 | 13 | 2 1/4 | 5 1/2 |

If desired, these reamers can be obtained with either left or right-hand spiral blades. Be sure to specify if so wanted.

# Patent Arbors for High Speed Adjustable Shell Reamers up to $3\frac{1}{8}$ Inches in Diameter

## Straight Shank—List No. 335

**Code Word—LEAGUE**

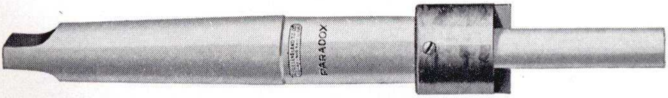


| Size No. | Price Each | Fitting Sizes of Adjustable Reamers Inches | Length Overall Inches |
|---|---|---|---|
| 5– 7 | $4.50 | $1\frac{3}{8}$ to $1\frac{9}{32}$ | 10 |
| 6– $7\frac{1}{2}$ | 4.95 | $1\frac{5}{8}$ to $1\frac{25}{32}$ | 11 |
| 7– 8 | 5.40 | $1\frac{13}{16}$ to $2\frac{9}{32}$ | 12 |
| 8– 9 | 6.00 | $2\frac{5}{16}$ to $2\frac{21}{32}$ | 13 |
| 9–10 | 6.75 | $2\frac{11}{16}$ to $3\frac{1}{8}$ | 14 |

These are the only Arbors we can recommend for use with High Speed Adjustable Shell Reamers up to $3\frac{1}{8}$ inches diameter.

## Taper Shank—List No. 336

**Code Word—LEAKAGE**



| Size No. | Price Each | Fitting Sizes of Adjustable Reamers Inches | Length Overall Inches | Taper Shank |
|---|---|---|---|---|
| 5– 7 | $5.40 | $1\frac{3}{8}$ to $1\frac{9}{32}$ | 10 | No. 3 |
| 6– $7\frac{1}{2}$ | 5.95 | $1\frac{5}{8}$ to $1\frac{25}{32}$ | 11 | No. 4 |
| 7– 8 | 6.50 | $1\frac{13}{16}$ to $2\frac{9}{32}$ | 12 | |
| 8– 9 | 7.20 | $2\frac{5}{16}$ to $2\frac{21}{32}$ | 13 | No. 5 |
| 9–10 | 8.10 | $2\frac{11}{16}$ to $3\frac{1}{8}$ | 14 | |

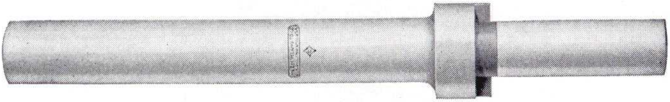
These are the only Arbors we can recommend for use with High Speed Adjustable Shell Reamers up to $3\frac{1}{8}$ inches diameter.

***Always Give List Number and Size Reamer When Ordering***

# Arbors for High Speed Adjustable Shell Reamers $3\frac{3}{16}$ Inches and Over in Diameter

## Straight Shank—List No. 133

**Code Word—LAMENTABLE**



| Size No. | Price Each | Fitting Sizes of Adjustable Reamers Inches | Length Overall Inches |
|---|---|---|---|
| 10 | $ 5.25 | $3\frac{3}{16}$ to $3\frac{1}{2}$ | 14 |
| 11 | 7.50 | $3\frac{9}{16}$ to $3\frac{7}{8}$ | 15 |
| 12 | 10.50 | $3\frac{15}{16}$ to $4\frac{1}{4}$ | 16 |
| 13 | 13.50 | $4\frac{5}{16}$ to $4\frac{1}{2}$ | 17 |

These Arbors are regular in all respects.

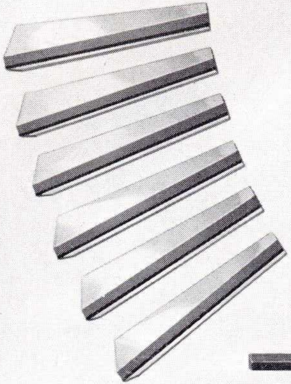
## Taper Shank—List No. 133A

**Code Word—LAMENTING**

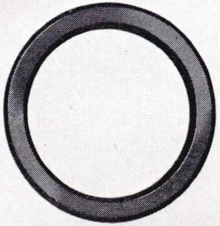
| Size No. | Price Each | Fitting Sizes of Adjustable Reamers Inches | Length Overall Inches | Taper Shank |
|---|---|---|---|---|
| 10 | $6.30 | $3\frac{3}{16}$ to $3\frac{1}{2}$ | 14 | No. 5 |
| 11 | 9.00 | $3\frac{9}{16}$ to $3\frac{7}{8}$ | 15 | |
| 12 | 12.60 | $3\frac{15}{16}$ to $4\frac{1}{4}$ | 16 | |
| 13 | 16.20 | $4\frac{5}{16}$ to $4\frac{1}{2}$ | 17 | |

These Arbors are regular in all respects.
Arbors for Reamers smaller than $3\frac{1}{8}$ inches diameter shown on page 123.

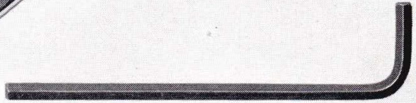
*Always Give List Number and Size Reamer When Ordering*



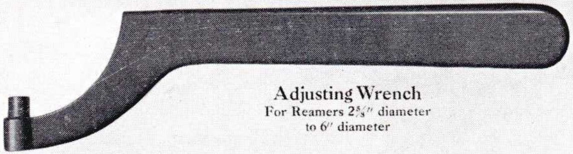
Blades



Adjusting Nut
For Reamers 2⅝″ diameter
to 6″ diameter

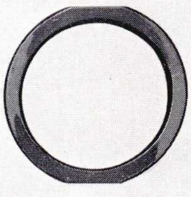


Screw Wrench
For Reamers 1½″ diameter to 6″ diameter

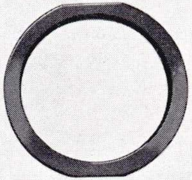


Adjusting Wrench
For Reamers 2⅝″ diameter
to 6″ diameter

Blade Screw



Adjusting Nut
For Reamers 1″ diameter
to 2⁹⁄₁₆″ diameter



Lock Nut
For Reamers 1″ diameter
to 2⁹⁄₁₆″ diameter

# Parts for High Speed Adjustable Reamers

| Reamer Size | Blades per Set | No. of Blades per Set | Screws Price Per Set | Adjusting Nuts Price Each | Lock Nuts Price Each | Screw Wrenches Price Each | Adjusting Wrenches Price Each |
|---|---|---|---|---|---|---|---|
| 1 | $ 5.00 | 6 | $ .60 | $1.50 | $1.00 | .... | .... |
| 1 1/32 | 5.00 | 6 | .60 | 1.50 | 1.00 | .... | .... |
| 1 1/16 | 5.00 | 6 | .60 | 1.50 | 1.00 | .... | .... |
| 1 3/32 | 5.00 | 6 | .60 | 1.50 | 1.00 | .... | .... |
| 1 1/8 | 5.50 | 6 | .60 | 1.50 | 1.00 | .... | .... |
| 1 5/32 | 5.50 | 6 | .60 | 1.50 | 1.00 | .... | .... |
| 1 3/16 | 5.50 | 6 | .60 | 1.50 | 1.00 | .... | .... |
| 1 1/4 | 5.50 | 6 | .60 | 1.75 | 1.10 | .... | .... |
| 1 5/16 | 5.50 | 6 | .60 | 1.75 | 1.10 | .... | .... |
| 1 3/8 | 6.00 | 6 | .75 | 1.75 | 1.10 | .... | .... |
| 1 7/16 | 6.00 | 6 | .75 | 1.75 | 1.10 | .... | .... |
| 1 1/2 | 6.00 | 6 | 1.25 | 1.75 | 1.10 | $.12 | .... |
| 1 9/16 | 6.00 | 6 | 1.25 | 1.75 | 1.10 | .12 | .... |
| 1 5/8 | 6.00 | 6 | 1.25 | 2.00 | 1.25 | .12 | .... |
| 1 11/16 | 6.00 | 6 | 1.25 | 2.00 | 1.25 | .12 | .... |
| 1 3/4 | 6.75 | 6 | 1.25 | 2.40 | 1.40 | .12 | .... |
| 1 13/16 | 6.75 | 6 | 1.25 | 2.40 | 1.40 | .12 | .... |
| 1 7/8 | 6.75 | 6 | 1.25 | 2.40 | 1.40 | .12 | .... |
| 1 15/16 | 6.75 | 6 | 1.25 | 2.40 | 1.40 | .12 | .... |
| 2 | 7.50 | 6 | 1.25 | 2.75 | 1.60 | .12 | .... |
| 2 1/16 | 7.50 | 6 | 1.25 | 2.75 | 1.60 | .12 | .... |
| 2 1/8 | 7.50 | 6 | 1.25 | 2.75 | 1.60 | .12 | .... |
| 2 3/16 | 7.50 | 6 | 1.25 | 2.75 | 1.60 | .12 | .... |
| 2 1/4 | 7.50 | 6 | 1.25 | 3.25 | 2.00 | .12 | .... |
| 2 5/16 | 7.50 | 6 | 1.25 | 3.25 | 2.00 | .12 | .... |
| 2 3/8 | 7.50 | 6 | 1.25 | 3.25 | 2.00 | .12 | .... |
| 2 7/16 | 7.50 | 6 | 1.25 | 3.25 | 2.00 | .12 | .... |
| 2 1/2 | 10.00 | 8 | 1.60 | 3.25 | 2.00 | .12 | .... |
| 2 9/16 | 10.00 | 8 | 1.60 | 3.25 | 2.00 | .12 | .... |
| 2 5/8 | 10.00 | 8 | 1.60 | 6.00 | .... | .12 | $.72 |
| 2 11/16 | 10.00 | 8 | 1.60 | 6.00 | .... | .12 | .72 |
| 2 3/4 | 10.00 | 8 | 1.60 | 6.00 | .... | .12 | .72 |
| 2 13/16 | 10.00 | 8 | 1.60 | 6.00 | .... | .12 | .72 |
| 2 7/8 | 10.00 | 8 | 1.60 | 6.50 | .... | .12 | .78 |
| 2 15/16 | 10.00 | 8 | 1.60 | 6.50 | .... | .12 | .78 |
| 3 | 12.00 | 8 | 1.60 | 6.50 | .... | .12 | .78 |
| 3 1/16 | 12.00 | 8 | 1.60 | 6.50 | .... | .12 | .78 |
| 3 1/8 | 12.00 | 8 | 1.60 | 7.00 | .... | .12 | .84 |
| 3 3/16 | 12.00 | 8 | 1.60 | 7.00 | .... | .12 | .84 |
| 3 1/4 | 12.00 | 8 | 1.60 | 7.00 | .... | .12 | .84 |
| 3 5/16 | 12.00 | 8 | 1.60 | 7.00 | .... | .12 | .84 |
| 3 3/8 | 12.00 | 8 | 2.00 | 7.75 | .... | .12 | .90 |

Single blades will be furnished at proportionate prices.

***Always Give List Number and Size of Reamer When Ordering***

# Parts for High Speed Adjustable Reamers

| Reamer Size | Blades per Set | No. of Blades per Set | Screws Price Per Set | Adjusting Nuts Price Each | Lock Nuts Price Each | Screw Wrenches Price Each | Adjusting Wrenches Price Each |
|---|---|---|---|---|---|---|---|
| 3 7/16 | $12.00 | 8 | $2.00 | $7.75 | .... | $.12 | $.90 |
| 3½ | 12.00 | 8 | 2.00 | 7.75 | .... | .12 | .90 |
| 3 9/16 | 12.00 | 8 | 2.00 | 7.75 | .... | .12 | .90 |
| 3⅝ | 12.00 | 8 | 2.50 | 7.75 | .... | .12 | .90 |
| 3 11/16 | 12.00 | 8 | 2.50 | 7.75 | .... | .12 | .90 |
| 3¾ | 12.00 | 8 | 2.50 | 8.50 | .... | .12 | .96 |
| 3 13/16 | 12.00 | 8 | 2.50 | 8.50 | .... | .12 | .96 |
| 3⅞ | 12.00 | 8 | 2.50 | 8.50 | .... | .12 | .96 |
| 3 15/16 | 12.00 | 8 | 2.50 | 8.50 | .... | .12 | .96 |
| 4 | 17.00 | 10 | 2.50 | 9.25 | .... | .12 | 1.02 |
| 4 1/16 | 17.00 | 10 | 2.50 | 9.25 | .... | 12 | 1.02 |
| 4⅛ | 17.00 | 10 | 2.50 | 9.25 | .... | .12 | 1.02 |
| 4 3/16 | 17.00 | 10 | 2.50 | 9.25 | .... | .12 | 1.02 |
| 4¼ | 17.00 | 10 | 2.50 | 10.00 | .... | .12 | 1.08 |
| 4 5/16 | 17.00 | 10 | 2.50 | 10.00 | .... | .12 | 1.08 |
| 4⅜ | 17.00 | 10 | 2.50 | 10.00 | .... | .12 | 1.08 |
| 4 7/16 | 17.00 | 10 | 2.50 | 10.00 | .... | .12 | 1.08 |
| 4½ | 20.00 | 10 | 2.50 | 10.00 | .... | .14 | 1.44 |
| 4 9/16 | 20.00 | 10 | 2.50 | 10.00 | .... | .14 | 1.44 |
| 4⅝ | 20.00 | 10 | 2.50 | 10.00 | .... | .14 | 1.44 |
| 4 11/16 | 20.00 | 10 | 2.50 | 10.00 | .... | .14 | 1.44 |
| 4¾ | 20.00 | 10 | 3.00 | 10.75 | .... | .14 | 1.44 |
| 4 13/16 | 20.00 | 10 | 3.00 | 10.75 | .... | .14 | 1.44 |
| 4⅞ | 20.00 | 10 | 3.00 | 10.75 | .... | .14 | 1.44 |
| 4 15/16 | 20.00 | 10 | 3.00 | 10.75 | .... | .14 | 1.44 |
| 5 | 20.00 | 10 | 3.00 | 11.50 | .... | .14 | 1.44 |
| 5 1/16 | 20.00 | 10 | 3.00 | 11.50 | .... | .14 | 1.44 |
| 5⅛ | 20.00 | 10 | 3.00 | 11.50 | .... | .14 | 1.44 |
| 5 3/16 | 20.00 | 10 | 3.00 | 11.50 | .... | .14 | 1.44 |
| 5¼ | 25.00 | 12 | 3.75 | 11.50 | .... | .14 | 1.44 |
| 5 5/16 | 25.00 | 12 | 3.75 | 11.50 | .... | .14 | 1.44 |
| 5⅜ | 25.00 | 12 | 3.75 | 11.50 | .... | .14 | 1.44 |
| 5 7/16 | 25.00 | 12 | 3.75 | 11.50 | .... | .14 | 1.44 |
| 5½ | 25.00 | 12 | 3.75 | 12.25 | .... | .14 | 1.44 |
| 5 9/16 | 25.00 | 12 | 3.75 | 12.25 | .... | .14 | 1.44 |
| 5⅝ | 25.00 | 12 | 3.75 | 12.25 | .... | .14 | 1.44 |
| 5 11/16 | 25.00 | 12 | 3.75 | 12.25 | .... | .14 | 1.44 |
| 5¾ | 25.00 | 12 | 3.75 | 12.25 | .... | .14 | 1.96 |
| 5 13/16 | 25.00 | 12 | 3.75 | 12.25 | .... | .14 | 1.96 |
| 5⅞ | 25.00 | 12 | 3.75 | 12.25 | .... | .14 | 1.96 |
| 5 15/16 | 25.00 | 12 | 3.75 | 12.25 | .... | .14 | 1.96 |
| 6 | 25.00 | 12 | 3.75 | 12.25 | .... | .14 | 1.96 |

Single blades will be furnished at proportionate prices.

***Always Give List Number and Size of Reamer When Ordering***

# Instructions for Adjusting "Cleveland" High Speed Adjustable Reamers

## List Nos. 606—607—608

1. Clean reamer thoroughly with kerosene to remove all dirt and chips, thereby preventing them from getting under the blades during adjusting.

2. Slightly loosen the set screws that hold the blades in place.

3. Loosen the locking nut.

4. Move the blades to the desired position. This should be done with the adjusting nut when expansion is desired. When contraction is desired, a piece of soft brass or babbitt should be used to tap the blades back against the adjusting nut.

5. Take up the "play" in the blade set screws.

6. Tap the blades back against the adjusting nut.

7. Tap the blades down into the blade slots along their full length.

8. Tighten locking nut.

9. Tighten blade set screws.

**Note:**—A linen tag, containing these instructions, is packed with each of these reamers. In case it is lost, or mislaid, the above information will prove useful.

# "PARADOX" ADJUSTABLE REAMERS

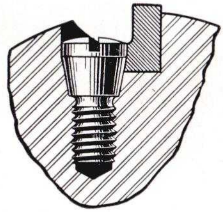
FOR ALPHABETICAL INDEX, SEE PAGES 221-229

FOR NUMERICAL INDEX, SEE PAGES 230-240

# "Paradox" Adjustable Reamers

**General Construction** "Paradox" Adjustable Reamers have a body of tough machinery steel, case-hardened where subject to wear, into which are inserted blades of finely-tempered carbon or high speed steel as desired.

**Adjustable, Yet Solid** The section drawing shows the simple, yet effective method of supporting the blades. Taper-headed screws wedge them firmly against their backing, the blades being countersunk at intervals along the shoulder at their base to fit the taper screw-heads. One of the screws is placed as near the end of the blade as possible, giving firm support where it is most needed—close to the cutting edge—and effectively preventing the tool from "hogging in." This construction makes it as rigid as a solid reamer.



**Making Adjustments** Adjustments are made by removing the blades and inserting tinfoil or some other similar substance in the grooves, care being taken to see that it is even and free from wrinkles the full length of the blade. We can supply tinfoil .0005 to .001 inch thick which we recommend for this purpose. After packing with foil, and replacing blades, the reamer must be ground and cleared on centers. Adjustments ranging from .0005 to $\frac{3}{32}$nd inch may be had in the case of 3-inch reamers, the range being less, of course, for the smaller sizes and somewhat greater for the larger reamers.

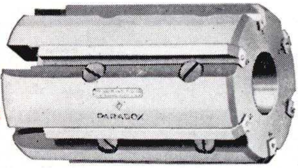
**New Blades** We can furnish additional blades from stock on short notice. If an entire new set is wanted the size and list number of the tool should be given.

**In Service** Testimony of our customers shows that a single "Paradox" Reamer with its original outfit of blades will ream as many accurate holes to a standard gauge as from eight to ten solid reamers.

# "Paradox"
# Adjustable Shell Reamers

**Carbon Steel Blades**
**List No. 301**
**Code Word—LEADER**

**High Speed Steel Blades**
**List No. 601**
**Code Word—LOWBORN**



**(Eccentric Flutes)**

| Diameter Inches | Price Each | | Size Hole Inches | Length of Blade Inches | Length Overall Inches | Fitting Arbor |
|---|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | | |
| 1 11/16 | $8.00 | $12.00 | 5/8 | 2 1/4 | 2 3/4 | No. 6-7 1/2 Page 133 |
| 1 3/4 | 8.15 | 12.50 | 5/8 | 2 1/4 | 2 3/4 | |
| 1 13/16 | 8.35 | 13.00 | 3/4 | 2 1/2 | 3 | No. 7-8 Page 133 |
| 1 7/8 | 8.50 | 13.50 | 3/4 | 2 1/2 | 3 | |
| 1 15/16 | 8.70 | 14.00 | 3/4 | 2 1/2 | 3 | |
| 2" | 8.85 | 14.50 | 3/4 | 2 1/2 | 3 | |
| 2 1/16 | 9.00 | 15.00 | 3/4 | 2 1/2 | 3 | |
| 2 1/8 | 9.25 | 15.50 | 3/4 | 2 1/2 | 3 | |
| 2 3/16 | 9.50 | 16.00 | 3/4 | 2 1/2 | 3 | |
| 2 1/4 | 9.70 | 16.50 | 3/4 | 2 1/2 | 3 | |
| 2 5/16 | 10.00 | 17.00 | 1 | 2 3/4 | 3 1/2 | No. 8-9 Page 133 |
| 2 3/8 | 10.25 | 17.50 | 1 | 2 3/4 | 3 1/2 | |
| 2 7/16 | 10.50 | 18.00 | 1 | 2 3/4 | 3 1/2 | |
| 2 1/2 | 10.75 | 18.50 | 1 | 2 3/4 | 3 1/2 | |
| 2 9/16 | 11.00 | 19.00 | 1 | 2 3/4 | 3 1/2 | |
| 2 5/8 | 11.50 | 19.50 | 1 | 2 3/4 | 3 1/2 | |
| 2 11/16 | 12.00 | 20.00 | 1 1/4 | 3 | 3 3/4 | No. 9-10 Page 133 |
| 2 3/4 | 12.50 | 20.50 | 1 1/4 | 3 | 3 3/4 | |
| 2 13/16 | 13.00 | 21.00 | 1 1/4 | 3 | 3 3/4 | |
| 2 7/8 | 13.50 | 21.50 | 1 1/4 | 3 | 3 3/4 | |
| 2 15/16 | 14.00 | 22.00 | 1 1/4 | 3 | 3 3/4 | |
| 3" | 14.50 | 22.50 | 1 1/4 | 3 | 3 3/4 | |

Arbors for "Paradox" Reamers on page 133.

Shell Reamers have taper holes, the diameter given being at the large end.

*Always Give List Number When Ordering*

# Arbors for "Paradox" Shell Reamers Up to 3 Inches in Diameter

REGULAR arbors small enough to go into "Paradox" Shell Reamers up to 3 inches in diameter have frequently been found to lack the necessary strength in the collar and shank. To overcome this difficulty, we have designed special arbors Nos. 335 and 336, with extra heavy collars and bodies.

Their construction is very similar to that of the Arbors shown on page 80. The collar is movably attached to the body, into which the driving keys, integral with the collar, are longitudinally mortised. The collar, after loosening the set-screw which secures it to the body, may be driven along the body in such a way as to release any tight-fitting shell tool without damaging it.

In the lists on the following page, the figure preceding the hyphen in the "Size No." column denotes the standard size of the Arbor-part proper, while the figure following the hyphen indicates the arbor size to which the dimensions of the rest of the tool approximately correspond.

These are the only arbors we recommend for use with "Paradox" Shell Reamers up to 3 inches diameter.

# Patent Arbors for "Paradox" Shell Reamers Up to 3 Inches in Diameter

## Straight Shank—List No. 335

**Code Word—LEAGUE**

| Size No. | Price Each | Fitting Sizes of Paradox Reamers Inches | Length Overall Inches |
|---|---|---|---|
| 6- 7½ | $4.95 | 1 11/16 to 1¾ | 11 |
| 7- 8 | 5.40 | 1 13/16 to 2¼ | 12 |
| 8- 9 | 6.00 | 2 5/16 to 2⅝ | 13 |
| 9-10 | 6.75 | 2 11/16 to 3 | 14 |

These are the only Arbors we can recommend for use with "Paradox" Shell Reamers up to 3 inches diameter.

## Taper Shank—List No. 336

**Code Word—LEAKAGE**

| Size No. | Price Each | Fitting Sizes of Paradox Reamers Inches | Length Overall Inches | Taper Shank |
|---|---|---|---|---|
| 6- 7½ | $5.95 | 1 11/16 to 1¾ | 11 | No. 4 |
| 7- 8 | 6.50 | 1 13/16 to 2¼ | 12 | |
| 8- 9 | 7.20 | 2 5/16 to 2⅝ | 13 | No. 5 |
| 9-10 | 8.10 | 2 11/16 to 3 | 14 | |

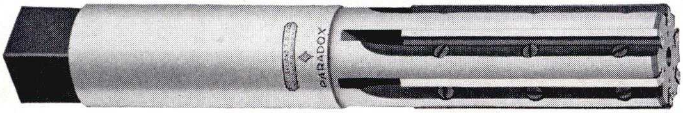
These are the only Arbors we can recommend for use with "Paradox" Shell Reamers up to 3 inches diameter.

*Always Give List Number When Ordering*

# "Paradox"
# Adjustable Hand Reamers

**Carbon Steel No. 306** **High Speed Steel No. 602**

**Code Word—LEADERLESS** **Code Word—LOWBOY**



| Diameter Inches | Price Each | | Length of Blade Inches | Length Overall Inches |
|---|---|---|---|---|
| | Carbon Steel | High Speed | | |
| 1″ | $6.40 | $10.00 | 3 | 7⅝ |
| 1 1/16 | 6.70 | 10.50 | 3⅛ | 7⅞ |
| 1⅛ | 7.00 | 11.00 | 3⅛ | 8⅛ |
| 1 3/16 | 7.40 | 11.50 | 3¼ | 8¼ |
| 1¼ | 7.80 | 12.00 | 3¼ | 8½ |
| 1 5/16 | 8.20 | 12.50 | 3½ | 8¾ |
| 1⅜ | 8.60 | 13.00 | 3½ | 9 |
| 1 7/16 | 9.00 | 13.50 | 3½ | 9¼ |
| 1½ | 9.40 | 14.20 | 3¾ | 9½ |
| 1 9/16 | 9.80 | 14.90 | 3¾ | 9⅝ |
| 1⅝ | 10.20 | 15.60 | 4 | 9⅞ |
| 1 11/16 | 10.60 | 16.30 | 4 | 10⅛ |
| 1¾ | 11.00 | 17.00 | 4 | 10¼ |
| 1 13/16 | 11.40 | 17.70 | 4¼ | 10½ |
| 1⅞ | 11.80 | 18.40 | 4¼ | 10¾ |
| 1 15/16 | 12.20 | 19.10 | 4¼ | 11 |
| 2″ | 12.65 | 19.80 | 4½ | 11¼ |

These Reamers can be furnished down to 11/16-inch diameter, but on account of their construction, the sizes smaller than 1-inch are not strong enough for any but the very lightest sort of work and we do not recommend their use.

For expanding these Reamers, Tinfoil of .001 and .0005-inch thickness will be furnished upon application.

*Always Give List Number When Ordering*

# "Paradox"
# Adjustable Chucking Reamers

**Carbon Steel No. 312**
**Code Word—LEADING**

**High Speed Steel No. 603**
**Code Word—LOWBRED**

| Diameter Inches | Price Each | | Length of Blade Inches | Length Overall Inches |
|---|---|---|---|---|
| | Carbon Steel | High Speed | | |
| 1" | $5.00 | $8.00 | 1 3/4 | 10 1/2 |
| 1 1/32 | 5.15 | 8.25 | 1 3/4 | 10 1/2 |
| 1 1/16 | 5.25 | 8.50 | 1 3/4 | 10 1/2 |
| 1 3/32 | 5.40 | 8.75 | 1 3/4 | 10 1/2 |
| 1 1/8 | 5.50 | 9.00 | 2 | 11 |
| 1 5/32 | 5.60 | 9.25 | 2 | 11 |
| 1 3/16 | 5.75 | 9.50 | 2 | 11 |
| 1 7/32 | 5.90 | 9.75 | 2 | 11 |
| 1 1/4 | 6.00 | 10.00 | 2 | 11 1/2 |
| 1 5/16 | 6.50 | 10.50 | 2 | 11 1/2 |
| 1 3/8 | 7.00 | 11.00 | 2 | 12 |
| 1 7/16 | 7.50 | 11.50 | 2 | 12 |
| 1 1/2 | 8.00 | 12.00 | 2 | 12 1/2 |
| 1 9/16 | 8.25 | 12.60 | 2 | 12 1/2 |
| 1 5/8 | 8.50 | 13.20 | 2 1/4 | 13 |
| 1 11/16 | 8.75 | 13.80 | 2 1/4 | 13 |
| 1 3/4 | 9.00 | 14.40 | 2 1/4 | 13 1/2 |
| 1 13/16 | 9.30 | 15.00 | 2 1/2 | 13 1/2 |
| 1 7/8 | 9.60 | 15.60 | 2 1/2 | 14 |
| 1 15/16 | 9.90 | 16.20 | 2 1/2 | 14 |
| 2" | 10.25 | 16.80 | 2 1/2 | 14 |

These Reamers can be furnished down to 11/16-inch diameter, but on account of their construction, the sizes smaller than 1-inch are not strong enough for any but the very lightest sort of work and we do not recommend their use.

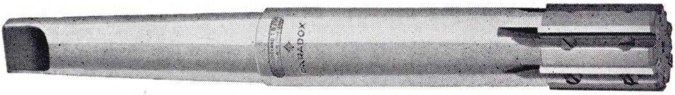
For expanding these Reamers, Tinfoil of .001 and .0005-inch thickness will be furnished upon application.

*Always Give List Number When Ordering*

# "Paradox"
# Adjustable Chucking Reamers with Taper Shanks

**Carbon Steel No. 317** **High Speed Steel No. 604**

**Code Word—LEADWALL** **Code Word—LOWBROW**



| Diameter Inches | Price Each | | Length of Blade Inches | Length Overall Inches | Shank Taper |
|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | |
| 1″ | $5.00 | $9.25 | $1\frac{3}{4}$ | $10\frac{1}{2}$ | No. 3 |
| $1\frac{1}{32}$ | 5.15 | 9.50 | $1\frac{3}{4}$ | $10\frac{1}{2}$ | |
| $1\frac{1}{16}$ | 5.25 | 9.75 | $1\frac{3}{4}$ | $10\frac{1}{2}$ | |
| $1\frac{3}{32}$ | 5.40 | 10.00 | $1\frac{3}{4}$ | $10\frac{1}{2}$ | |
| $1\frac{1}{8}$ | 5.50 | 10.30 | 2 | 11 | |
| $1\frac{5}{32}$ | 5.60 | 10.60 | 2 | 11 | |
| $1\frac{3}{16}$ | 5.75 | 10.90 | 2 | 11 | |
| $1\frac{7}{32}$ | 5.90 | 11.20 | 2 | 11 | |
| $1\frac{1}{4}$ | 6.00 | 11.50 | 2 | $11\frac{1}{2}$ | No. 4 |
| $1\frac{5}{16}$ | 6.50 | 12.10 | 2 | $11\frac{1}{2}$ | |
| $1\frac{3}{8}$ | 7.00 | 12.70 | 2 | 12 | |
| $1\frac{7}{16}$ | 7.50 | 13.30 | 2 | 12 | |
| $1\frac{1}{2}$ | 8.00 | 13.90 | 2 | $12\frac{1}{2}$ | |
| $1\frac{9}{16}$ | 8.25 | 14.50 | 2 | $12\frac{1}{2}$ | |
| $1\frac{5}{8}$ | 8.50 | 15.15 | $2\frac{1}{4}$ | 13 | |
| $1\frac{11}{16}$ | 8.75 | 15.85 | $2\frac{1}{4}$ | 13 | |
| $1\frac{3}{4}$ | 9.00 | 16.55 | $2\frac{1}{4}$ | $13\frac{1}{2}$ | No. 5 |
| $1\frac{13}{16}$ | 9.30 | 17.25 | $2\frac{1}{2}$ | $13\frac{1}{2}$ | |
| $1\frac{7}{8}$ | 9.60 | 17.95 | $2\frac{1}{2}$ | 14 | |
| $1\frac{15}{16}$ | 9.90 | 18.65 | $2\frac{1}{2}$ | 14 | |
| 2″ | 10.25 | 19.35 | $2\frac{1}{2}$ | 14 | |

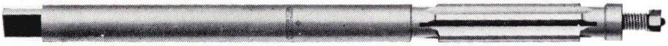
These Reamers can be furnished down to $\frac{11}{16}$-inch diameter, but on account of their construction, the sizes smaller than 1-inch are not strong enough for any but the very lightest sort of work, and we do not recommend their use.

For expanding these Reamers, Tinfoil of .001 and .0005-inch thickness will be furnished upon application.

*Always Give List Number When Ordering*

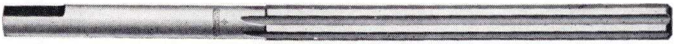
## Special Reamers

### Expansion Reamer, with Extra Long Shank

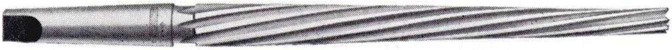


### Machine Reamer, Extra Long

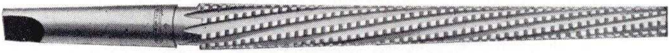
(Eccentric Flutes)



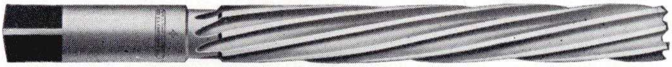
### Taper Shank, Spiral Flute, Finishing Reamer



### Taper Shank, Spiral Flute, Roughing Reamer

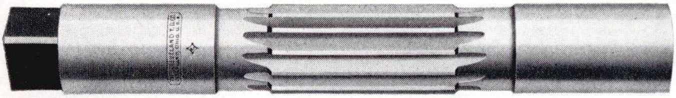


### Hand Reamer, Spiral Fluted, Extra Long

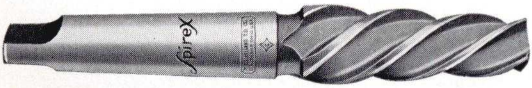


### Hand Reamer, with Pilot

(Eccentric Flutes)



### "Spirex" Reamer with Special Taper



We make to order a large number of Special Reamers to meet varying needs; our long experience, with our large and well equipped plant, enabling us to give valuable service in making suggestions or in working out designs.

When ordering or desiring quotations on Special Reamers, please refer to pages 174 and 175 for information ordinarily required.

*Always Give List Number When Ordering*

# Special Reamers and Counterbore

## Combination Drill and Reamer

This tool is designed to drill the initial hole and ream it to size in one operation. To obtain accurate results, the tool should be operated through a jig bushing which will guide the reamer section. The length of the drill part should be slightly greater than the depth of the hole to be drilled and reamed.

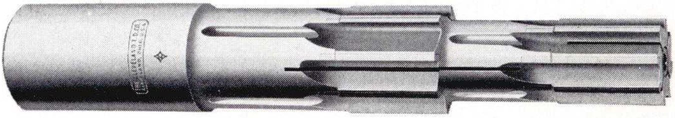
This type tool can be made with six or four reamer flutes as shown.

Shanks may be made of any style required.

## Peerless Taper Shank Expansion Line Reamer

This tool is designed for line reaming two or more holes of the same size. It is of Peerless type construction having hardened high speed steel inserts running the full length of pilot, reamer, and guide with the expansion feature in the reaming section. The expansion feature is to compensate for wear only.

This type of tool can be made with any type shank.

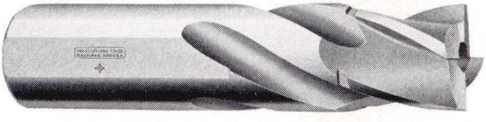


## Peerless Expansion Reamer with Two Diameters

This tool is designed for the line reaming of two holes of different diameters. It can be made with either diameter having the expansion feature and on some tools both diameters may be expanded. The tool illustrated is of this latter type in which either diameter may be expanded without disturbing the other.

The expansion is to provide for wear only and the tool should be reground after expanding.

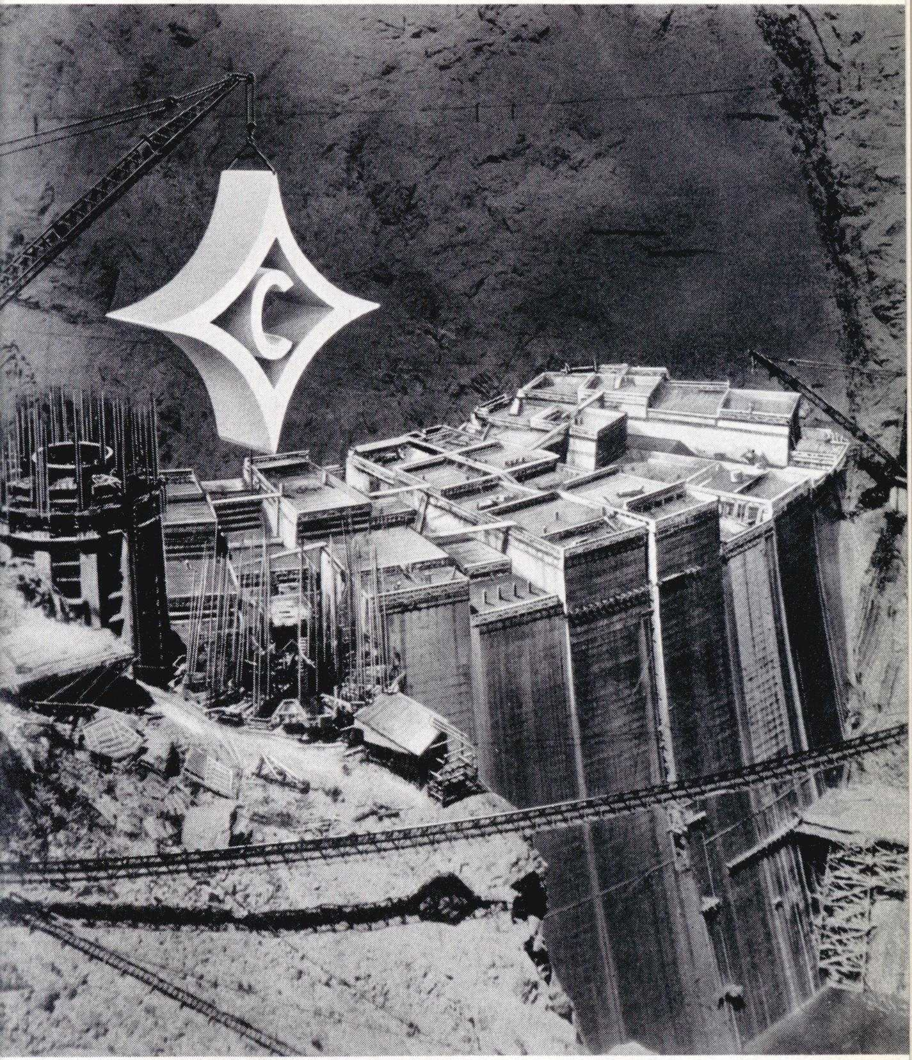
This type tool can be made with piloting sections in front of each set of cutting edges and can be made in any type shank.



## Combination Counterbore

This type tool is made in various diameter combinations and can be made with a pilot. The tool illustrated is made with a hole through the entire length for an oil feed and is used as a combination counterbore and spotfacer.

# MISCELLANEOUS TOOLS



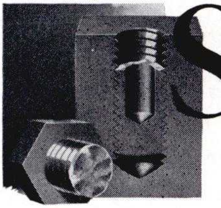
FOR ALPHABETICAL INDEX, SEE PAGES 221-229

FOR NUMERICAL INDEX, SEE PAGES 230-240

EZY-OUT
TRADE MARK REG.
U.S. PAT. OFF.

# Screw Extractors

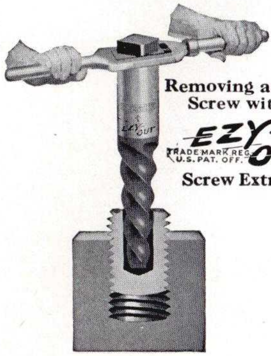
(The Original Screw Extractor)



SOME twenty years ago this Company introduced "Ezy-Out" Screw Extractors and has distributed them to almost every part of the world. "Ezy-Out" has become the commonly accepted name for the little tool that has made the formerly difficult task of removing a broken screw an easy one.

During this time, "Ezy-Out" undoubtedly has saved industrial plants and automotive repair shops hundreds of thousands of dollars in time, as well as possible damage to other parts. It has become indispensable for the quick and easy removal of broken set and cap screws, studs, staybolts, pipe fittings, etc.

**How Easy "Ezy-Out" Is** For the benefit of the "younger generation," let it be said that the old method of digging out broken screws was to assemble an assortment of files, punches and drifts and, almost literally, to cut the broken screw out of its hole. The usual result was to ruin the threaded hole, necessitating retapping and the fitting of a larger screw. With "Ezy-Out," however, you merely drill a hole in the broken screw, insert the proper size "Ezy-Out" Screw Extractor and start a left-hand twist. This forces "Ezy-Out's" corkscrew-like spirals to grip the sides of the drilled hole. Something simply has to "give"—and it isn't "Ezy-Out." Out comes the broken screw on its threads—and the threads of the hole remain intact.



**Removing a broken Screw with an EZY-OUT TRADE MARK REG. U.S. PAT. OFF. Screw Extractor**

"Ezy-Out" Screw Extractors are illustrated and listed in the following pages. They may be obtained in any of 12 sizes and five handy sets.

But, when ordering Screw Extractors, please be sure to say that you want "Ezy-Out."
**It is the original screw extractor.**

EZY-OUT

TRADE MARK REG.
U.S. PAT. OFF.

# Screw Extractors

## List No. 192

**Code Word—LANDTAPE**

EZY-OUT SCREW EXTRACTORS represent a form of shop insurance which the truly well-equipped plant can hardly afford to do without. Ezy-Out is not an "every-day" tool, but when it does become necessary to "dig out" an especially stubborn and deeply imbedded broken screw, it is absolutely indispensable.

At least one set of Ezy-Out Screw Extractors should be a part of the tool equipment of every industrial plant, every coal mine, every steamship, every garage and repair shop, and every automobile owner who likes to "tinker" with his car.

| Extractor No. | Price Each | Diameter at Small End | Diameter at Large End | Length of Flute | Length Overall | Size Drill to Use | Extractor No. |
|---|---|---|---|---|---|---|---|
| 1 | $ .55 | .054 | .117 | 1/2 | 2 | 5/64 | 1 |
| 2 | .60 | .080 | .174 | 3/4 | 2 3/8 | 7/64 | 2 |
| 3 | .65 | 1/8 | 1/4 | 1 | 2 11/16 | 5/32 | 3 |
| 4 | .75 | 3/16 | 21/64 | 1 1/8 | 2 7/8 | 1/4 | 4 |
| 5 | .85 | 1/4 | 7/16 | 1 1/2 | 3 3/8 | 17/64 | 5 |
| 6 | 1.00 | 3/8 | 19/32 | 1 3/4 | 3 3/4 | 13/32 | 6 |
| 7 | 1.35 | 1/2 | 3/4 | 2 | 4 1/8 | 17/32 | 7 |
| 8 | 1.85 | 3/4 | 1 | 2 | 4 3/8 | 13/16 | 8 |
| 9 | 2.65 | 1 | 1 9/32 | 2 1/4 | 4 5/8 | 1 1/16 | 9 |
| 10 | 4.00 | 1 1/4 | 1 9/16 | 2 1/2 | 5 | 1 5/16 | 10 |
| 11 | 5.35 | 1 1/2 | 1 7/8 | 3 | 5 5/8 | 1 9/16 | 11 |
| 12 | 6.65 | 1 7/8 | 2 5/16 | 3 1/2 | 6 1/4 | 1 15/16 | 12 |

**Note**—Always use the largest possible Ezy-Out Screw Extractor. For ordinary conditions we recommend using the size drill shown opposite the Ezy-Out size. Unusual conditions may, however, require the use of a smaller or larger drill, depending on the length of the broken part or its depth in the hole.

EZY-OUT

TRADE MARK REG.
U.S. PAT. OFF.

# Screw Extractors

## In Sets

EZY-OUT
SCREW
EXTRACTORS AND STRAIGHT SHANK DRILLS
THE CLEVELAND TWIST DRILL CO.
No. 20

## No. 20 Set

**Code Word—PARLANDER**

No. 20 Set includes Ezy-Out Screw Extractors, sizes Nos. 1 to 6 inclusive, with the proper straight shank drill to use with each extractor.

This is a most complete and convenient set for garage or general use. It enables you to find the right drill for use with Ezy-Out.

This set is capable of handling any size bolt, cap or set screw from small electrical parts to one inch studs.

No. 20 set comes in a varnished case with slide cover and individual compartments for six Ezy-Outs and six drills.

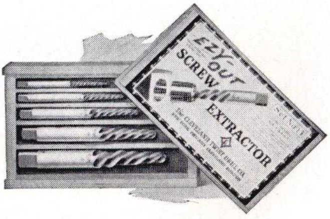
**Price Complete $5.00**

## No. 15 Set

**Code Word—PARLANCEDA**

No. 15 Set includes Ezy-Out Screw Extractors, sizes Nos. 1 to 5 inclusive, and was designed especially for tool room and lighter repair work.

Although this set does not give the extreme range of the No. 15A and No. 20 Sets, it will be found of great use for removing the smaller broken cap or set screws, or bolts.



**Price Complete $3.00**

EZY-OUT
SCREW EXTRACTOR

## No. 17 Set

**Code Word—PARLANCETT**

No. 17 contains Ezy-Out Screw Extractors, sizes Nos. 4, 5 and 6. It is designed for general machine shop use, and will handle any bolt, cap or set screw from $\frac{5}{16}''$ up to 1″.

Although this set does not include the small sizes necessary for tool room and garage work, it will be found most valuable for the larger cap and set screws.

**Price Complete $2.35**

EZY-OUT

TRADE MARK REG.
U.S. PAT. OFF.

# Screw Extractors

## In Sets

### No. 15A Set

**Code Word—PARLANCEFY**

EZY-OUT
SCREW
EXTRACTOR

No. 15A includes Ezy-Out Screw Extractors, sizes Nos. 1 to 6 inclusive, and was designed especially for garage work.

For general use around the garage this set will be found invaluable and will handle practically any broken threaded piece.

Although we recommend the No. 20 Set, which contains the proper drills to use with the extractors, to those who do not wish to purchase the drills the No. 15A set will be found most useful and a real time saver.

**Price Complete $4.00**

### No. 16 Set

**Code Word—PARLANCEGO**

EZY-OUT
SCREW
EXTRACTOR

No. 16 contains Ezy-Out Screw Extractors, sizes Nos. 6, 7, 8 and 9. It will handle any broken bolt from ½″ to 1½″.

This is known as "The Heavy Shop Set" and will particularly interest railroad, steel and structural workers.

**Price Complete $6.65**

CLEVELAND

TRADE MARK REG. U. S. PAT. OFF AND FOREIGN COUNTRIES

## High-Speed Counterbores and Spot Facers

The Cleveland High Speed Counterbores and Spot Facers illustrated and listed on the following pages, present the following advantages:

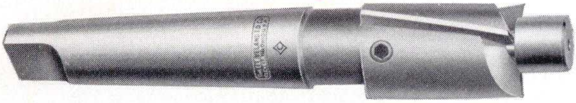
**Simplicity** These Counterbores and Spot Facers are made of the best grade of High Speed Steel, simple in design, with no unnecessary or easily mislaid parts. The shanks are Standard taper shanks so they may be used directly in the machine spindles.

The pilots are made of the best grade of Carbon Tool Steel properly heat treated and ground and are simple in design, having a straight shank with a flat for the set screw.

**Economy** The flutes are made extra long which gives extended life for regrinding and permits the counterboring and spot facing of parts which cannot be reached with a short tool.

**Rigidity and Strength** The counterbore and spot facer being integral with the shank and the shank being a Standard taper, permits the tool to be used directly in the machine spindle, eliminating all holders and adapters. The shape of the flutes is designed to give maximum strength with ample chip clearance and the odd number of flutes tends to prevent chatter when spot facing.

# High Speed Short Set Taper Shank Counterbores and Spot Facers with Interchangeable Pilots



## List No. 878

**Code Word—LUSTO**

| Diameter Inches | Price Each | Length Overall Inches | Shank Taper | No. of Flutes | Hole Diam. Inches | Range of Pilot Sizes Inches |
|---|---|---|---|---|---|---|
| 1/4 | $3.50 | 3 13/16 | 1 | 3 | 3/32 | 1/8- 3/16 |
| 9/32 | 3.50 | 3 13/16 | 1 | 3 | 3/32 | 1/8- 7/32 |
| 5/16 | 3.50 | 3 13/16 | 1 | 3 | 3/32 | 1/8- 1/4 |
| 11/32 | 3.70 | 3 13/16 | 1 | 3 | 3/32 | 1/8- 9/32 |
| 3/8 | 3.70 | 4 1/16 | 1 | 3 | 5/32 | 3/16- 5/16 |
| 13/32 | 3.90 | 4 1/16 | 1 | 3 | 5/32 | 3/16- 11/32 |
| 7/16 | 3.90 | 4 1/16 | 1 | 3 | 5/32 | 3/16- 3/8 |
| 15/32 | 4.15 | 4 5/16 | 1 | 3 | 3/16 | 1/4- 13/32 |
| 1/2 | 4.15 | 4 5/16 | 1 | 3 | 3/16 | 1/4- 7/16 |
| 17/32 | 4.40 | 4 5/16 | 1 | 3 | 3/16 | 1/4- 15/32 |
| 9/16 | 4.40 | 4 5/16 | 1 | 3 | 3/16 | 1/4- 1/2 |
| 19/32 | 4.70 | 5 1/8 | 2 | 3 | 3/16 | 1/4- 17/32 |
| 5/8 | 4.70 | 5 1/8 | 2 | 3 | 3/16 | 1/4- 9/16 |
| 21/32 | 4.95 | 5 1/8 | 2 | 3 | 3/16 | 1/4- 19/32 |
| 11/16 | 4.95 | 5 1/8 | 2 | 3 | 3/16 | 1/4- 5/8 |
| 23/32 | 5.20 | 5 3/8 | 2 | 3 | 1/4 | 5/16- 21/32 |
| 3/4 | 5.20 | 5 3/8 | 2 | 3 | 1/4 | 5/16- 11/16 |
| 25/32 | 5.45 | 5 3/8 | 2 | 3 | 1/4 | 5/16- 23/32 |
| 13/16 | 5.45 | 5 3/8 | 2 | 3 | 1/4 | 5/16- 3/4 |
| 7/8 | 5.70 | 5 3/8 | 2 | 3 | 1/4 | 5/16- 13/16 |
| 15/16 | 6.00 | 6 1/8 | 3 | 3 | 1/4 | 5/16- 7/8 |
| 1 | 6.25 | 6 3/8 | 3 | 3 | 5/16 | 3/8- 15/16 |
| 1 1/16 | 6.50 | 6 3/8 | 3 | 3 | 5/16 | 3/8-1 |

| PILOTS | |
|---|---|
| Diam. Inches | Price Each |
| 1/8 | $.90 |
| 5/32 | .90 |
| 3/16 | .90 |
| 7/32 | 1.00 |
| 1/4 | 1.00 |
| 5/16 | 1.10 |
| 3/8 | 1.10 |
| 7/16 | 1.25 |
| 1/2 | 1.25 |
| 9/16 | 1.40 |
| 5/8 | 1.40 |
| 11/16 | 1.55 |
| 3/4 | 1.55 |
| 13/16 | 1.70 |
| 7/8 | 1.70 |
| 15/16 | 1.85 |
| 1 | 1.85 |
| 1 1/16 | 2.00 |
| 1 1/8 | 2.00 |
| 1 3/16 | 2.25 |
| 1 1/4 | 2.25 |
| 1 5/16 | 2.50 |
| 1 3/8 | 2.50 |
| 1 7/16 | 2.75 |

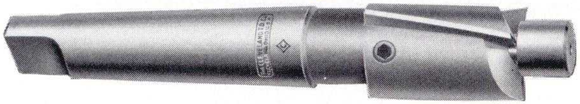
**Continued on next page**

The above counterbores can be furnished in Straight Shank or Taper Shank Long Set if desired. (**Prices upon application.**)

Fraction and decimal sizes of pilots not listed can be furnished at prices of next larger size.

When ordering pilots be sure to specify size of counterbore. ***This is important.***

# High Speed Short Set Taper Shank Counterbores and Spot Facers with Interchangeable Pilots



## List No. 878

**Code Word—LUSTO**

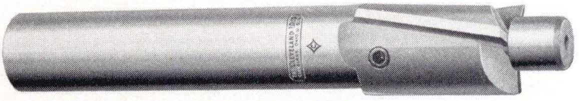
| Diameter Inches | Price Each | Length Overall Inches | Shank Taper | No. of Flutes | Hole Diam. Inches | Range of Pilot Sizes Inches | PILOTS Diam. Inches | PILOTS Price Each |
|---|---|---|---|---|---|---|---|---|
| 1⅛ | $6.75 | 6⅜ | 3 | 3 | 5/16 | ⅜-1 1/16 | 1½ | $2.75 |
| 1 3/16 | 7.00 | 6⅜ | 3 | 3 | 5/16 | ⅜-1⅛ | 1 9/16 | 3.00 |
| 1¼ | 7.50 | 6⅝ | 3 | 5 | ⅜ | 7/16-1 3/16 | 1⅝ | 3.00 |
| 1 5/16 | 8.00 | 6⅝ | 3 | 5 | ⅜ | 7/16-1¼ | 1 11/16 | 3.25 |
| 1⅜ | 8.50 | 6⅝ | 3 | 5 | ⅜ | 7/16-1 5/16 | 1¾ | 3.25 |
| 1 7/16 | 9.50 | 7⅞ | 4 | 5 | ⅜ | 7/16-1⅜ | 1 13/16<br>1⅞ | 3.50<br>3.50 |
| 1½ | 10.00 | 7⅞ | 4 | 5 | ⅜ | 7/16-1 7/16 | 1 15/16 | 3.75 |
| 1 9/16 | 10.75 | 8⅛ | 4 | 5 | 7/16 | ½-1½ | 2 | 3.75 |
| 1⅝ | 11.50 | 8⅛ | 4 | 5 | 7/16 | ½-1 9/16 | 2 1/16 | 4.00 |
| 1 11/16 | 12.25 | 8⅛ | 4 | 5 | 7/16 | ½-1⅝ | 2⅛ | 4.00 |
| 1¾ | 13.00 | 8⅛ | 4 | 5 | 7/16 | ½-1 11/16 | 2 3/16 | 4.25 |
| 1 13/16 | 13.75 | 8⅛ | 4 | 5 | 7/16 | ½-1¾ | 2¼ | 4.25 |
| 1⅞ | 14.50 | 8⅛ | 4 | 5 | 7/16 | ½-1 13/16 | 2 5/16 | 4.50 |
| 1 15/16 | 15.50 | 8⅛ | 4 | 5 | 7/16 | ½-1⅞ | 2⅜ | 4.50 |
| 2 | 16.50 | 8⅜ | 4 | 5 | ½ | 9/16-1 15/16 | 2 7/16 | 4.75 |
| 2⅛ | 18.75 | 9⅞ | 5 | 5 | ½ | 9/16-2 1/16 | 2½ | 4.75 |
| 2¼ | 20.25 | 9⅞ | 5 | 5 | ½ | 9/16-2 3/16 | 2 9/16 | 5.00 |
| 2⅜ | 21.75 | 9⅞ | 5 | 5 | ½ | 9/16-2 5/16 | 2⅝ | 5.00 |
| 2½ | 23.25 | 9⅞ | 5 | 5 | ½ | 9/16-2 7/16 | 2 11/16 | 5.25 |
| 2⅝ | 25.25 | 9⅞ | 5 | 5 | ½ | 9/16-2 9/16 | 2¾ | 5.25 |
| 2¾ | 27.25 | 9⅞ | 5 | 5 | ½ | 9/16-2 11/16 | 2 13/16 | 5.50 |
| 2⅞ | 29.50 | 9⅞ | 5 | 5 | ½ | 9/16-2 13/16 | 2⅞ | 5.50 |
| 3 | 32.00 | 9⅞ | 5 | 5 | ½ | 9/16-2 15/16 | 2 15/16 | 5.75 |

The above counterbores can be furnished in Straight Shank or Taper Shank Long Set if desired. (**Prices upon application.**)

Fraction and decimal sizes of pilots not listed can be furnished at prices of next larger size.

When ordering pilots be sure to specify size of counterbore. ***This is important.***

# High Speed Short Set Straight Shank Counterbores and Spot Facers with Interchangeable Pilots



## List No. 879

**Code Word—LUSTROUS**

| Diameter Inches | Price Each | Length Overall Inches | Shank Size Length | No. of Flutes | Hole Diam. Inches | Range of Pilot Sizes Inches |
|---|---|---|---|---|---|---|
| 1/4 | $3.50 | 3 13/16 | 15/64x3 1/16 | 3 | 3/32 | 1/8– 3/16 |
| 9/32 | 3.50 | 3 13/16 | 17/64x3 1/16 | 3 | 3/32 | 1/8– 7/32 |
| 5/16 | 3.50 | 3 13/16 | 19/64x3 1/16 | 3 | 3/32 | 1/8– 1/4 |
| 11/32 | 3.70 | 3 13/16 | 5/16x3 1/16 | 3 | 3/32 | 1/8– 9/32 |
| 3/8 | 3.70 | 4 1/16 | 5/16x3 1/16 | 3 | 5/32 | 3/16– 5/16 |
| 13/32 | 3.90 | 4 1/16 | 3/8x3 1/16 | 3 | 5/32 | 3/16– 11/32 |
| 7/16 | 3.90 | 4 1/16 | 3/8x3 1/16 | 3 | 5/32 | 3/16– 3/8 |
| 15/32 | 4.15 | 4 5/16 | 7/16x3 1/16 | 3 | 3/16 | 1/4– 13/32 |
| 1/2 | 4.15 | 4 5/16 | 7/16–3 1/16 | 3 | 3/16 | 1/4– 7/16 |
| 17/32 | 4.40 | 4 5/16 | 1/2x3 1/16 | 3 | 3/16 | 1/4– 15/32 |
| 9/16 | 4.40 | 4 5/16 | 1/2x3 1/16 | 3 | 3/16 | 1/4– 1/2 |
| 19/32 | 4.70 | 5 1/8 | 1/2x3 7/8 | 3 | 3/16 | 1/4– 17/32 |
| 5/8 | 4.70 | 5 1/8 | 1/2x3 7/8 | 3 | 3/16 | 1/4– 9/16 |
| 21/32 | 4.95 | 5 1/8 | 1/2x3 7/8 | 3 | 3/16 | 1/4– 19/32 |
| 11/16 | 4.95 | 5 1/8 | 1/2x3 7/8 | 3 | 3/16 | 1/4– 5/8 |
| 23/32 | 5.20 | 5 3/8 | 1/2x3 7/8 | 3 | 1/4 | 5/16– 21/32 |
| 3/4 | 5.20 | 5 3/8 | 1/2x3 7/8 | 3 | 1/4 | 5/16– 11/16 |
| 25/32 | 5.45 | 5 3/8 | 5/8x3 7/8 | 3 | 1/4 | 5/16– 23/32 |
| 13/16 | 5.45 | 5 3/8 | 5/8x3 7/8 | 3 | 1/4 | 5/16– 3/4 |
| 7/8 | 5.70 | 5 3/8 | 3/4x3 7/8 | 3 | 1/4 | 5/16– 13/16 |
| 15/16 | 6.00 | 6 1/8 | 3/4x4 5/8 | 3 | 1/4 | 5/16– 7/8 |
| 1″ | 6.25 | 6 3/8 | 3/4x4 5/8 | 3 | 5/16 | 3/8– 15/16 |
| 1 1/16 | 6.50 | 6 3/8 | 3/4x4 5/8 | 3 | 5/16 | 3/8–1″ |

**Diameters and prices of pilots for this tool will be found on pages 145 and 146.**

**Continued on next page**

The above counterbores can be furnished in Straight Shank or Taper Shank Long Set if desired. (**Prices upon application.**)

Fraction and decimal sizes of pilots not listed can be furnished at prices of next larger size.

When ordering pilots be sure to specify size of counterbore. ***This is important.***

*Always Give List Number When Ordering*

# High Speed Short Set Straight Shank Counterbores and Spot Facers

### with Interchangeable Pilots

## List No. 879

**Code Word—LUSTROUS**

| Diameter Inches | Price Each | Length Overall Inches | Shank Size Length | No. of Flutes | Hole Diam. Inches | Range of Pilot Sizes Inches |
|---|---|---|---|---|---|---|
| $1\frac{1}{8}$ | $6.75 | $6\frac{3}{8}$ | 1″ x$4\frac{5}{8}$ | 3 | $\frac{5}{16}$ | $\frac{3}{8}$–$1\frac{1}{16}$ |
| $1\frac{3}{16}$ | 7.00 | $6\frac{3}{8}$ | 1″ x$4\frac{5}{8}$ | 3 | $\frac{5}{16}$ | $\frac{3}{8}$–$1\frac{1}{8}$ |
| $1\frac{1}{4}$ | 7.50 | $6\frac{5}{8}$ | 1″ x$4\frac{5}{8}$ | 5 | $\frac{3}{8}$ | $\frac{7}{16}$–$1\frac{3}{16}$ |
| $1\frac{5}{16}$ | 8.00 | $6\frac{5}{8}$ | 1″ x$4\frac{5}{8}$ | 5 | $\frac{3}{8}$ | $\frac{7}{16}$–$1\frac{1}{4}$ |
| $1\frac{3}{8}$ | 8.50 | $6\frac{5}{8}$ | 1″ x$4\frac{5}{8}$ | 5 | $\frac{3}{8}$ | $\frac{7}{16}$–$1\frac{5}{16}$ |
| $1\frac{7}{16}$ | 9.50 | $7\frac{7}{8}$ | $1\frac{1}{4}$x$5\frac{7}{8}$ | 5 | $\frac{3}{8}$ | $\frac{7}{16}$–$1\frac{3}{8}$ |
| $1\frac{1}{2}$ | 10.00 | $7\frac{7}{8}$ | $1\frac{1}{4}$x$5\frac{7}{8}$ | 5 | $\frac{3}{8}$ | $\frac{7}{16}$–$1\frac{7}{16}$ |
| $1\frac{9}{16}$ | 10.75 | $8\frac{1}{8}$ | $1\frac{1}{4}$x$5\frac{7}{8}$ | 5 | $\frac{7}{16}$ | $\frac{1}{2}$–$1\frac{1}{2}$ |
| $1\frac{5}{8}$ | 11.50 | $8\frac{1}{8}$ | $1\frac{1}{4}$x$5\frac{7}{8}$ | 5 | $\frac{7}{16}$ | $\frac{1}{2}$–$1\frac{9}{16}$ |
| $1\frac{11}{16}$ | 12.25 | $8\frac{1}{8}$ | $1\frac{1}{4}$x$5\frac{7}{8}$ | 5 | $\frac{7}{16}$ | $\frac{1}{2}$–$1\frac{5}{8}$ |
| $1\frac{3}{4}$ | 13.00 | $8\frac{1}{8}$ | $1\frac{1}{4}$x$5\frac{7}{8}$ | 5 | $\frac{7}{16}$ | $\frac{1}{2}$–$1\frac{11}{16}$ |
| $1\frac{13}{16}$ | 13.75 | $8\frac{1}{8}$ | $1\frac{1}{2}$x$5\frac{7}{8}$ | 5 | $\frac{7}{16}$ | $\frac{1}{2}$–$1\frac{3}{4}$ |
| $1\frac{7}{8}$ | 14.50 | $8\frac{1}{8}$ | $1\frac{1}{2}$x$5\frac{7}{8}$ | 5 | $\frac{7}{16}$ | $\frac{1}{2}$–$1\frac{13}{16}$ |
| $1\frac{15}{16}$ | 15.50 | $8\frac{1}{8}$ | $1\frac{1}{2}$x$5\frac{7}{8}$ | 5 | $\frac{7}{16}$ | $\frac{1}{2}$–$1\frac{7}{8}$ |
| 2″ | 16.50 | $8\frac{3}{8}$ | $1\frac{1}{2}$x$5\frac{7}{8}$ | 5 | $\frac{1}{2}$ | $\frac{9}{16}$–$1\frac{15}{16}$ |
| $2\frac{1}{8}$ | 18.75 | $9\frac{7}{8}$ | $1\frac{1}{2}$x$7\frac{3}{8}$ | 5 | $\frac{1}{2}$ | $\frac{9}{16}$–$2\frac{1}{16}$ |
| $2\frac{1}{4}$ | 20.25 | $9\frac{7}{8}$ | $1\frac{1}{2}$x$7\frac{3}{8}$ | 5 | $\frac{1}{2}$ | $\frac{9}{16}$–$2\frac{3}{16}$ |
| $2\frac{3}{8}$ | 21.75 | $9\frac{7}{8}$ | $1\frac{3}{4}$x$7\frac{3}{8}$ | 5 | $\frac{1}{2}$ | $\frac{9}{16}$–$2\frac{5}{16}$ |
| $2\frac{1}{2}$ | 23.25 | $9\frac{7}{8}$ | $1\frac{3}{4}$x$7\frac{3}{8}$ | 5 | $\frac{1}{2}$ | $\frac{9}{16}$–$2\frac{7}{16}$ |
| $2\frac{5}{8}$ | 25.25 | $9\frac{7}{8}$ | $1\frac{3}{4}$x$7\frac{3}{8}$ | 5 | $\frac{1}{2}$ | $\frac{9}{16}$–$2\frac{9}{16}$ |
| $2\frac{3}{4}$ | 27.25 | $9\frac{7}{8}$ | $1\frac{3}{4}$x$7\frac{3}{8}$ | 5 | $\frac{1}{2}$ | $\frac{9}{16}$–$2\frac{11}{16}$ |
| $2\frac{7}{8}$ | 29.50 | $9\frac{7}{8}$ | $1\frac{3}{4}$x$7\frac{3}{8}$ | 5 | $\frac{1}{2}$ | $\frac{9}{16}$–$2\frac{13}{16}$ |
| 3″ | 32.00 | $9\frac{7}{8}$ | $1\frac{3}{4}$x$7\frac{3}{8}$ | 5 | $\frac{1}{2}$ | $\frac{9}{16}$–$2\frac{15}{16}$ |

**Diameters and prices of pilots for this tool will be found on pages 145 and 146.**

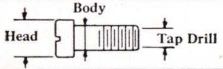
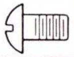
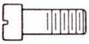
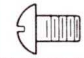
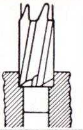
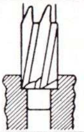
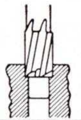
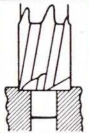
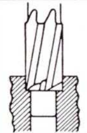
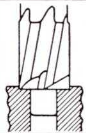
The above counterbores can be furnished in Straight Shank or Taper Shank Long Set if desired. (**Prices upon application.**)

Fraction and decimal sizes of pilots not listed can be furnished at prices of next larger size.

When ordering pilots be sure to specify size of counterbore. ***This is important.***

*Always Give List Number When Ordering*

# Counterbore Sizes for Cap Screws and Machine Screws

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| |  | | | | | |  | |  | |  | | |
| |  | |  | |  | |  | |  | |  | | |
| | Fillister Head Cap Screw | | Fillister Head Cap Screw | | Body and Tap Hole for any Screw | | Round or Hexagon Head Cap Screw | | Fillister Head Machine Screw | | Round or Hex.Head Machine Screw | | |
| | Head and Body | | Head and Tap Hole | | | | Head and Body | | Head and Body | | Head and Body | | |
| Size Thread N.F. and N.C | Cutter for Head | Pilot for Body | Cutter for Head | Pilot for Tap Hole | Cutter for Body | Pilot for Tap Hole | Cutter for Head | Pilot for Body | Cutter for Head | Pilot for Body | Cutter for Head | Pilot for Body | Tap Drills |
| ¼–28 | .375 | .250 | .375 | 213 | .250 | .213 | .500 | .250 | .437 | .250 | .500 | .250 | 3 |
| ¼–20 | .375 | .250 | .375 | .201 | .250 | .201 | .500 | .250 | .437 | .250 | .500 | .250 | 7 |
| 5/16–24 | .437 | .312 | .437 | 272 | .312 | .272 | .625 | .312 | .531 | .312 | .625 | .312 | I |
| 5/16–18 | .437 | .312 | .437 | 257 | .312 | .257 | .625 | .312 | .531 | .312 | .625 | .312 | F |
| ⅜–24 | .562 | .375 | .562 | .332 | .375 | .332 | .687 | .375 | .625 | .375 | .750 | .375 | Q |
| ⅜–16 | .562 | .375 | .562 | .312 | .375 | .312 | .687 | .375 | .625 | .375 | .750 | .375 | 5/16 |
| 7/16–20 | .625 | .437 | .625 | .390 | .437 | .390 | .813 | .437 | .718 | .437 | .875 | .437 | 25/64 |
| 7/16–14 | .625 | .437 | .625 | .368 | .437 | .368 | .813 | .437 | .718 | .437 | .875 | .437 | U |
| ½–20 | .750 | .500 | .750 | .453 | .500 | .453 | .875 | .500 | .843 | .500 | 1.000 | .500 | 29/64 |
| ½–13 | .750 | .500 | .750 | .421 | .500 | .421 | .875 | .500 | .843 | .500 | 1.000 | .500 | 27/64 |
| 9/16–18 | .812 | .562 | .812 | .515 | .562 | .515 | 1.000 | .562 | | | | | 33/64 |
| 9/16–12 | .812 | .562 | .812 | .484 | .562 | .484 | 1.000 | .562 | | | | | 31/64 |
| ⅝–18 | .875 | .625 | .875 | .578 | .625 | .578 | 1.062 | .625 | | | | | 37/64 |
| ⅝–11 | .875 | .625 | .875 | .531 | .625 | .531 | 1.062 | .625 | | | | | 17/32 |
| ¾–16 | 1.000 | .750 | 1.000 | .687 | .750 | .687 | 1.312 | .750 | | | | | 11/16 |
| ¾–10 | 1.000 | .750 | 1.000 | .656 | .750 | .656 | 1.312 | .750 | | | | | 21/32 |
| ⅞–14 | 1.125 | .875 | 1.125 | .812 | .875 | .812 | 1.375 | .875 | | | | | 13/16 |
| ⅞– 9 | 1.125 | .875 | 1.125 | .765 | .875 | .765 | 1.375 | .875 | | | | | 49/64 |
| 1–14 | 1.312 | 1.000 | 1.312 | .937 | 1.000 | .937 | 1.500 | 1.000 | | | | | 15/16 |
| 1– 8 | 1.312 | 1.000 | 1.312 | .875 | 1.000 | .875 | 1.500 | 1.000 | | | | | ⅞ |

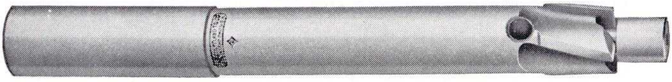
All sizes of counterbores and pilots shown on this page can be supplied from stock at regular prices.

# Straight Shank Counterbores

## With Interchangeable Pilots

**Carbon Steel No. 176**
**Code Word—LANDSORE**

**High Speed Steel No. 876**
**Code Word—LUSTER**



(Four Fluted)

| Diameter Inches | Price Each | | Length Overall Inches | Size of Shank Inches | Group Letter | Range of Pilot Sizes Inches | Pilot Prices | |
|---|---|---|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | | | Diameter Inches | Price Each |
| 5/16 | $1.70 | $2.20 | 5 3/4 | 3/8x2 1/4 | A | 11/64 to 1/4 | 3/16 | $ .50 |
| 11/32 | 1.75 | 2.35 | 5 3/4 | 3/8x2 1/4 | | 11/64 to 9/32 | 7/32 | .50 |
| 3/8 | 1.80 | 2.50 | 5 3/4 | 3/8x2 1/4 | | 11/64 to 5/16 | 1/4 | .50 |
| 7/16 | 1.90 | 2.80 | 6 1/8 | 7/16x2 1/4 | B | 15/64 to 3/8 | 5/16 | .50 |
| 1/2 | 2.00 | 3.10 | 6 3/8 | 1/2x2 1/2 | | 15/64 to 7/16 | 3/8 | .50 |
| 9/16 | 2.15 | 3.50 | 6 1/2 | 1/2x2 1/2 | | 15/64 to 1/2 | 7/16 | .50 |
| 5/8 | 2.30 | 4.00 | 7 | 5/8x2 5/8 | | 15/64 to 9/16 | 1/2 | .50 |
| | | | | | | | 9/16 | .75 |
| 11/16 | 2.45 | 4.60 | 7 | 5/8x2 5/8 | C | 5/16 to 5/8 | 5/8 | .75 |
| 3/4 | 2.60 | 5.25 | 7 1/4 | 3/4x2 3/4 | | 5/16 to 11/16 | 11/16 | .75 |
| 13/16 | 2.80 | 6.00 | 7 1/2 | 3/4x2 3/4 | | 5/16 to 3/4 | 3/4 | .75 |
| 7/8 | 3.00 | 6.75 | 7 3/4 | 7/8x3 | D | 25/64 to 13/16 | 13/16 | 1.00 |
| 15/16 | 3.25 | 7.50 | 8 1/2 | 7/8x3 | | 25/64 to 7/8 | 7/8 | 1.00 |
| 1″ | 3.50 | 8.25 | 9 | 1 x3 | | 25/64 to 15/16 | 15/16 | 1.00 |
| | | | | | | | 1 | 1.00 |
| 1 1/16 | 3.75 | 9.00 | 9 | 1 x3 | E | 15/32 to 1 | 1 1/16 | 1.25 |
| 1 1/8 | 4.00 | 9.75 | 9 1/4 | 1 1/8x3 1/4 | | 15/32 to 1 1/16 | 1 1/8 | 1.25 |
| 1 3/16 | 4.50 | 10.50 | 9 1/4 | 1 1/8x3 1/4 | | 15/32 to 1 1/8 | 1 3/16 | 1.25 |
| 1 1/4 | 5.00 | 11.25 | 9 1/2 | 1 1/4x3 1/2 | | 15/32 to 1 3/16 | 1 1/4 | 1.25 |
| 1 5/16 | 5.50 | 12.00 | 9 1/2 | 1 1/4x3 1/2 | | 15/32 to 1 1/4 | 1 5/16 | 1.25 |
| 1 3/8 | 6.00 | 13.00 | 9 1/2 | 1 1/4x3 1/2 | | 15/32 to 1 5/16 | | |

The Group Letter refers to the size of the taper pilot holes in the counterbores. Counterbores with the same Group Letter have the same size taper pilot hole. The Pilots have taper shanks ground to fit the taper pilot hole in the end of the counterbore. As the Pilots in each group are interchangeable, fitting any size counterbore in the group, a wide variety of combinations is possible. To eject Pilots insert taper pin in drift hole provided.

Fraction and decimal sizes of Pilots not listed can be furnished at prices of next larger size.

When ordering Counterbores always specify sizes of Pilots wanted.

When ordering **Pilots** always give size and *Group Letter*.

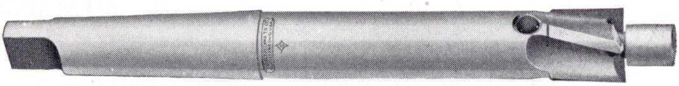
*Tap Drill and Screw Head Sizes—See Page 149*

# Taper Shank Counterbores

## With Interchangeable Pilots

**Carbon Steel No. 177**
**Code Word—LANDSOWER**

**High Speed Steel No. 877**
**Code Word—LUSTERING**



(Four Fluted)

| Diameter Inches | Price Each | | Length Over-all Inches | Shank Taper | Group Letter | Range of Pilot Sizes Inches | Pilot Prices | |
|---|---|---|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | | | Diameter Inches | Price Each |
| 5/16 | $1.85 | $2.50 | 5 3/4 | No. 1 | A | 11/64 to 1/4 | 3/16 | $ .50 |
| 11/32 | 1.95 | 2.65 | 5 3/4 | | | 11/64 to 9/32 | 7/32 | .50 |
| 3/8 | 2.00 | 2.80 | 5 3/4 | | | 11/64 to 5/16 | 1/4 | .50 |
| 7/16 | 2.10 | 3.10 | 6 1/8 | No. 1 | B | 15/64 to 3/8 | 5/16 | .50 |
| 1/2 | 2.20 | 3.40 | 6 3/8 | | | 15/64 to 7/16 | 3/8 | .50 |
| 9/16 | 2.35 | 3.80 | 6 1/2 | | | 15/64 to 1/2 | 7/16 | .50 |
| 5/8 | 2.55 | 4.30 | 7 | No. 2 | | 15/64 to 9/16 | 1/2 | .50 |
| | | | | | | | 9/16 | .75 |
| 11/16 | 2.70 | 5.00 | 7 | No. 2 | C | 5/16 to 5/8 | 5/8 | .75 |
| 3/4 | 2.85 | 5.65 | 7 1/4 | | | 5/16 to 11/16 | 11/16 | .75 |
| 13/16 | 3.10 | 6.40 | 7 1/2 | | | 5/16 to 3/4 | 3/4 | .75 |
| 7/8 | 3.30 | 7.20 | 7 3/4 | No. 2 | | 25/64 to 13/16 | 13/16 | 1.00 |
| 15/16 | 3.55 | 8.00 | 8 1/2 | No. 3 | D | 25/64 to 7/8 | 7/8 | 1.00 |
| 1″ | 3.85 | 8.75 | 9 | | | 25/64 to 15/16 | 15/16 | 1.00 |
| | | | | | | | 1 | 1.00 |
| 1 1/16 | 4.15 | 9.50 | 9 | No. 3 | E | 15/32 to 1 | 1 1/16 | 1.25 |
| 1 1/8 | 4.40 | 10.25 | 9 1/4 | | | 15/32 to 1 1/16 | 1 1/8 | 1.25 |
| 1 3/16 | 4.95 | 11.10 | 9 1/4 | | | 15/32 to 1 1/8 | 1 3/16 | 1.25 |
| 1 1/4 | 5.50 | 11.90 | 9 1/2 | | | 15/32 to 1 3/16 | 1 1/4 | 1.25 |
| 1 5/16 | 6.05 | 12.70 | 9 1/2 | | | 15/32 to 1 1/4 | 1 5/16 | 1.25 |
| 1 3/8 | 6.60 | 13.80 | 9 1/2 | | | 15/32 to 1 5/16 | | |

The Group Letter refers to the size of the taper pilot holes in the counterbores. Counterbores with the same Group Letter have the same size taper pilot hole. The Pilots have taper shanks ground to fit the taper pilot hole in the end of the counterbore. As the Pilots in each group are interchangeable, fitting any size counterbore in the group, a wide variety of combinations is possible. To eject Pilots insert taper pin in drift hole provided.

Fraction and decimal sizes of Pilots not listed can be furnished at prices of next larger size.

When ordering Counterbores always specify sizes of Pilots wanted.

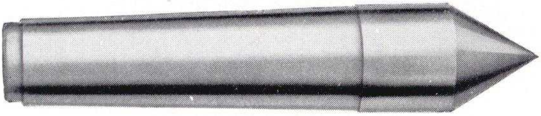
When ordering Pilots always give size and *Group Letter.*

*Tap Drill and Screw Head Sizes—See Page 149*

# Lathe Centers

## High Speed Steel — List No. 890

**Code Word—LUTE**



These Lathe Centers have high speed points; both ends hardened; shanks accurately ground. The included angle of the points is 60, ground true. The accuracy of angle of these tools can be depended upon. They can be operated at a high rate of speed without danger of burning.

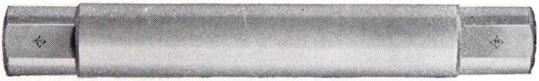
| Taper Shank No. | Price Each | Whole Length Inches | Length of Body Inches |
|---|---|---|---|
| 0 | $1.50 | 2⅞ | ¾ |
| 1 | 1.75 | 3 5/16 | 1 |
| 2 | 2.50 | 4 3/16 | 1 7/16 |
| 3 | 3.25 | 5¼ | 1⅞ |
| 4 | 4.75 | 6¾ | 2 7/16 |
| 5 | 9.25 | 8½ | 3 1/16 |

*Always Give List Number When Ordering*

# Hardened and Ground Steel Mandrels

## List No. 143

**Code Word—LANDLADY**



| Diameter Inches | Price Each | Length Overall Inches | Diameter Inches | Price Each | Length Overall Inches |
|---|---|---|---|---|---|
| ⅛ | $1.20 | 2½ | 1 3/16 | $4.00 | 7¾ |
| 5/32 | 1.20 | 3 | 1¼ | 4.00 | 8 |
| 3/16 | 1.20 | 3 | 1 5/16 | 4.80 | 8¼ |
| 7/32 | 1.20 | 3¾ | 1⅜ | 4.80 | 8½ |
| ¼ | 1.20 | 3¾ | 1 7/16 | 5.60 | 8¾ |
| 9/32 | 1.30 | 4 | 1½ | 5.60 | 9 |
| 5/16 | 1.30 | 4 | 1 9/16 | 6.40 | 9¼ |
| 11/32 | 1.40 | 4¼ | 1⅝ | 6.40 | 9½ |
| ⅜ | 1.40 | 4¼ | 1 11/16 | 7.20 | 9¾ |
| 13/32 | 1.50 | 4½ | 1¾ | 7.20 | 10 |
| 7/16 | 1.50 | 4½ | 1 13/16 | 8.00 | 10¼ |
| 15/32 | 1.60 | 5 | 1⅞ | 8.00 | 10½ |
| ½ | 1.60 | 5 | 1 15/16 | 9.00 | 10¾ |
| 9/16 | 1.80 | 5¼ | 2″ | 9.00 | 11 |
| ⅝ | 1.80 | 5½ | 2⅛ | 10.00 | 11½ |
| 11/16 | 2.00 | 5¾ | 2¼ | 11.00 | 12 |
| ¾ | 2.00 | 6 | 2⅜ | 12.00 | 12 |
| 13/16 | 2.40 | 6¼ | 2½ | 13.00 | 12½ |
| ⅞ | 2.40 | 6½ | 2⅝ | 14.50 | 12½ |
| 15/16 | 2.80 | 6¾ | 2¾ | 16.00 | 13 |
| 1″ | 2.80 | 7 | 2⅞ | 17.50 | 13 |
| 1 1/16 | 3.40 | 7¼ | 3″ | 19.00 | 13 |
| 1⅛ | 3.40 | 7½ | | | |

These Mandrels are made of good quality tool steel, hardened and ground perfectly true, to fit holes reamed by our reamers. They are slightly tapering, and the size is stamped on the large end. They are not injured by careful driving. We recommend rawhide hammers for this purpose.

All sizes and dimensions not listed are special and subject to special prices.

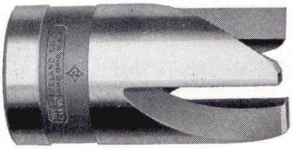
# Plain Hollow Mills

**Carbon Steel No. 180**
**Code Word—LANDSQUALL**

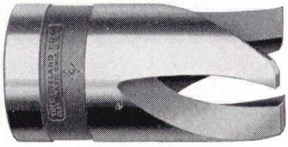
**High Speed Steel No. 660**
**Code Word—LUDICROUS**

**Carbon Steel No. 181**
**Code Word—LANDSQUEAK**

**High Speed Steel No. 661**
**Code Word—LUDLAM**



**For Brass**



**For Steel**

| Size Hole Inches | Price Each | | Outside Diameter Inches | Length Overall Inches |
|---|---|---|---|---|
| | Carbon Steel | High Speed | | |
| 3/32 | $1.35 | $3.60 | 5/8 | 1 1/2 |
| 1/8 | 1.35 | 3.60 | 5/8 | 1 1/2 |
| 5/32 | 1.35 | 3.60 | 5/8 | 1 1/2 |
| 3/16 | 1.35 | 3.60 | 5/8 | 1 1/2 |
| 7/32 | 1.35 | 3.60 | 5/8 | 1 1/2 |
| 1/4 | 1.35 | 3.60 | 5/8 | 1 1/2 |
| 9/32 | 2.00 | 3.90 | 3/4 | 1 3/4 |
| 5/16 | 2.00 | 3.90 | 3/4 | 1 3/4 |
| 11/32 | 2.00 | 3.90 | 3/4 | 1 3/4 |
| 3/8 | 2.70 | 4.25 | 1 | 2 |
| 7/16 | 2.70 | 4.25 | 1 | 2 |
| 1/2 | 2.70 | 4.25 | 1 | 2 |
| 9/16 | 3.00 | 5.55 | 1 1/4 | 2 1/4 |
| 5/8 | 3.00 | 5.55 | 1 1/4 | 2 1/4 |
| 11/16 | 3.35 | 6.85 | 1 1/2 | 2 1/2 |
| 3/4 | 3.35 | 6.85 | 1 1/2 | 2 1/2 |
| 13/16 | 3.35 | 6.85 | 1 1/2 | 2 1/2 |
| 7/8 | 4.00 | 8.45 | 1 3/4 | 2 3/4 |
| 15/16 | 4.00 | 8.45 | 1 3/4 | 2 3/4 |
| 1″ | 4.00 | 8.45 | 1 3/4 | 2 3/4 |

*Always Give List Number When Ordering*

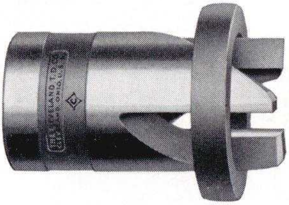
# Adjustable Hollow Mills

## Carbon Steel No. 182
**Code Word—LANDSQUIB**

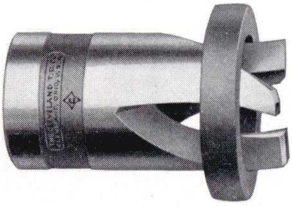
## High Speed Steel No. 662
**Code Word—LUDSON**

## Carbon Steel No. 183
**Code Word—LANDSQUIRE**

## High Speed Steel No. 663
**Code Word—LUDWIG**



**For Brass**



**For Steel**

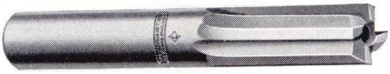
| Size Hole Inches | Price Each | | Outside Diameter Inches | Length Overall Inches |
|---|---|---|---|---|
| | Carbon Steel | High Speed | | |
| 3/32 | $1.85 | $4.25 | 5/8 | 1 1/2 |
| 1/8 | 1.85 | 4.25 | 5/8 | 1 1/2 |
| 5/32 | 1.85 | 4.25 | 5/8 | 1 1/2 |
| 3/16 | 1.85 | 4.25 | 5/8 | 1 1/2 |
| 7/32 | 1.85 | 4.25 | 5/8 | 1 1/2 |
| 1/4 | 1.85 | 4.25 | 5/8 | 1 1/2 |
| 9/32 | 2.60 | 4.70 | 3/4 | 1 3/4 |
| 5/16 | 2.60 | 4.70 | 3/4 | 1 3/4 |
| 11/32 | 2.60 | 4.70 | 3/4 | 1 3/4 |
| 3/8 | 3.50 | 5.20 | 1 | 2 |
| 7/16 | 3.50 | 5.20 | 1 | 2 |
| 1/2 | 3.50 | 5.20 | 1 | 2 |
| 9/16 | 4.00 | 6.85 | 1 1/4 | 2 1/4 |
| 5/8 | 4.00 | 6.85 | 1 1/4 | 2 1/4 |
| 11/16 | 4.60 | 8.45 | 1 1/2 | 2 1/2 |
| 3/4 | 4.60 | 8.45 | 1 1/2 | 2 1/2 |
| 13/16 | 4.60 | 8.45 | 1 1/2 | 2 1/2 |
| 7/8 | 5.50 | 10.40 | 1 3/4 | 2 3/4 |
| 15/16 | 5.50 | 10.40 | 1 3/4 | 2 3/4 |
| 1″ | 5.50 | 10.40 | 1 3/4 | 2 3/4 |

# Coarse Tooth Straight Shank End Mills

**Carbon Steel No. 184** **High Speed Steel No. 674**

**Code Word—LANDSTAR** **Code Word—LUGWORM**

**Straight Flutes**



**In sizes up to 7/32″**

**Straight Shank End Mills under ¼″ have straight flutes. Sizes ¼″ and over Right-Hand End Mills have right hand spiral flutes and Left-Hand Mills have left hand spiral flutes. This cut shows a Right-Hand Mill.**

| | Diameter Inches | Price Each | | Length of Cut Inches | Length Overall Inches |
|---|---|---|---|---|---|
| | | Carbon Steel | High Speed | | |
| **Furnished with Straight Flutes** | ⅛ | $.70 | $1.40 | 5/16 | 1¼ |
| | 5/32 | .80 | 1.50 | 5/16 | 1¼ |
| | 3/16 | .90 | 1.70 | ½ | 1⅜ |
| | 7/32 | .90 | 1.80 | 9/16 | 1⅝ |

**Spiral Flutes**

**In sizes ¼″ and larger**

| | Diameter Inches | Price Each | | Length of Cut Inches | Length Overall Inches |
|---|---|---|---|---|---|
| | | Carbon Steel | High Speed | | |
| **Furnished with Spiral Flutes** | ¼ | $.90 | $1.80 | ⅝ | 1 11/16 |
| | 5/16 | 1.00 | 1.90 | 11/16 | 1¾ |
| | ⅜ | 1.10 | 2.10 | ¾ | 1 13/16 |
| | 7/16 | 1.20 | 2.30 | ⅞ | 2 3/16 |
| | ½ | 1.30 | 2.50 | 15/16 | 2¼ |
| | 9/16 | 1.40 | 2.70 | 1″ | 2 5/16 |
| | ⅝ | 1.50 | 3.00 | 1⅛ | 2½ |
| | ¾ | 1.80 | 3.50 | 1¼ | 2⅝ |

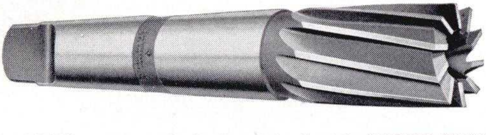
These End Mills have large deep center holes which will facilitate resharpening. End Mills having dimensions other than listed are special and subject to special prices. When ordering always state whether **Right** or **Left** hand cut is wanted.

# Spiral-Fluted End Mills

## Fitted with Regular Taper Shanks

**Carbon Steel No. 185**
**Code Word—LANDSUDS**

**High Speed Steel No. 675**
**Code Word—LUKE**



**These End Mills are regularly furnished with RIGHT-HAND cut and right hand spiral flutes. Left Hand End Mills are special. This cut shows a Right-Hand Mill.**

| Diameter Inches | Price Each | | Length of Cut Inches | Length Overall Inches | Shank Taper No. |
|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | |
| ¼ | $1.60 | $3.20 | ⅝ | 3½ | 1 |
| 5/16 | 1.70 | 3.30 | 11/16 | 3 9/16 | 1 |
| ⅜ | 1.70 | 3.30 | ¾ | 3⅝ | 1 |
| 7/16 | 1.70 | 3.30 | ⅞ | 3¾ | 1 |
| ½ | 1.70 | 3.40 | 15/16 | 3 13/16 | 1 |
| ½ | 2.40 | 4.80 | 15/16 | 4 7/16 | 2 |
| ⅝ | 2.50 | 4.90 | 1⅛ | 4⅝ | 2 |
| ¾ | 2.50 | 4.90 | 1¼ | 4¾ | 2 |
| ¾ | 3.50 | 7.00 | 1¼ | 5 9/16 | 3 |
| ⅞ | 2.90 | 5.70 | 1 7/16 | 4 15/16 | 2 |
| ⅞ | 3.50 | 7.00 | 1 7/16 | 5¾ | 3 |
| 1″ | 3.30 | 6.60 | 1⅝ | 5⅛ | 2 |
| 1″ | 3.70 | 7.30 | 1⅝ | 5 15/16 | 3 |
| 1⅛ | 4.20 | 8.40 | 1¾ | 6 1/16 | 3 |
| 1¼ | 4.80 | 9.60 | 2 | 6 5/16 | 3 |

These End Mills have large deep center holes which will facilitate resharpening. End Mills having dimensions other than listed are special and subject to special prices. When ordering always state whether **Right** or **Left** hand cut is wanted. Be sure to state the shank number wanted.

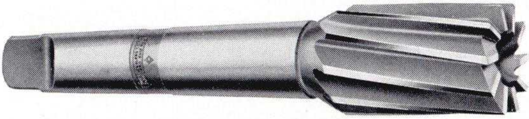
*"Peerless" Puts the Cost Where It Counts*

# Spiral-Fluted End Mills

## With Brown & Sharpe Shanks

**Carbon Steel No. 186**
Code Word—LANDSYRUP

**High Speed Steel No. 676**
Code Word—LUKEWARM



These End Mills are furnished as regular with either right or left hand cut. Right Hand Mills have right hand spiral flutes, and Left Hand Mills left hand spiral flutes.

Mills with No. 5 shanks are regularly furnished without tangs. Mills with No. 9 shanks are furnished either with tang end or shank tapped for draw-in bolt, as desired, at prices quoted below. For draw-in bolt, tapped hole in shank will be ⅝″-11 N. C. right hand Class 2 fit. Minimum length of full thread ¾″.

Unless otherwise specified, mills with No. 9 shanks will be furnished with tang end.

| Diameter Inches | Price Each | | Length of Cut Inches | Length Overall Inches | Shank Taper No. |
|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | |
| ¼ | $1.70 | $3.30 | ⅝ | 2 13/16 | 5 |
| 5/16 | 1.70 | 3.30 | 11/16 | 2⅞ | 5 |
| ⅜ | 1.70 | 3.30 | ¾ | 2 15/16 | 5 |
| 7/16 | 1.80 | 3.50 | ⅞ | 3 1/16 | 5 |
| ½ | 1.80 | 3.50 | 15/16 | 3⅛ | 5 |
| ½ | 2.60 | 5.10 | 15/16 | 4 15/16 | 7 |
| 9/16 | 2.60 | 5.10 | 1 | 5 | 7 |
| ⅝ | 2.70 | 5.30 | 1⅛ | 5⅛ | 7 |
| ¾ | 2.70 | 5.30 | 1¼ | 5¼ | 7 |
| ⅞ | 3.10 | 6.10 | 1 7/16 | 5 7/16 | 7 |
| 1″ | 3.50 | 7.00 | 1⅝ | 5⅝ | 7 |
| 1⅛ | 4.70 | 9.30 | 1¾ | 7 | 9 |
| 1¼ | 5.30 | 10.50 | 2 | 7¼ | 9 |
| 1½ | 6.70 | 13.30 | 2¼ | 7½ | 9 |
| 1¾ | 8.30 | 16.60 | 2½ | 7¾ | 9 |
| 2″ | 10.50 | 21.00 | 2¾ | 8 | 9 |

These End Mills have large deep center holes which will facilitate resharpening.

End Mills having dimensions other than listed are special and subject to special prices. When ordering always state whether **Right** or **Left** hand cut is wanted. Be sure to state the shank number wanted.

*Always Give List Number When Ordering*

# Coarse Tooth Spiral-Fluted End Mills

## with Brown & Sharpe Shanks

## High Speed Steel

## List No. 677

**Code Word—LUKIM**

These End Mills are furnished as regular with either right or left hand cut. Right Hand Mills have right hand spiral flutes, and Left Hand Mills left hand spiral flutes.

Mills with No. 5 shanks are regularly furnished without tangs. Mills with No. 9 shanks are furnished either with tang end or shank tapped for draw-in bolt, as desired, at prices quoted below. For draw-in bolt, tapped hole in shank will be 5/8″-11 N. C. right hand Class 2 fit. Minimum length of full thread 3/4″.

Unless otherwise specified, mills with No. 9 shanks will be furnished with tang end.

| Diameter Inches | Price Each | Length of Cut Inches | Length Overall Inches | Shank Taper No. |
|---|---|---|---|---|
| 1/4 | $3.30 | 5/8 | 2 13/16 | 5 |
| 5/16 | 3.30 | 11/16 | 2 7/8 | 5 |
| 3/8 | 3.30 | 3/4 | 2 15/16 | 5 |
| 7/16 | 3.50 | 7/8 | 3 1/16 | 5 |
| 1/2 | 3.50 | 15/16 | 3 1/8 | 5 |
| 1/2 | 5.10 | 15/16 | 4 15/16 | 7 |
| 9/16 | 5.10 | 1 | 5 | 7 |
| 5/8 | 5.30 | 1 1/8 | 5 1/8 | 7 |
| 3/4 | 5.30 | 1 1/4 | 5 1/4 | 7 |
| 7/8 | 6.10 | 1 7/16 | 5 7/16 | 7 |
| 1 | 7.00 | 1 5/8 | 5 5/8 | 7 |
| 1 1/8 | 9.30 | 1 3/4 | 7 | 9 |
| 1 1/4 | 10.50 | 2 | 7 1/4 | 9 |
| 1 1/2 | 13.30 | 2 1/4 | 7 1/2 | 9 |
| 1 3/4 | 16.60 | 2 1/2 | 7 3/4 | 9 |
| 2 | 21.00 | 2 3/4 | 8 | 9 |

These End Mills have large deep center holes which will facilitate resharpening.

End Mills having dimensions other than listed are special and subject to special prices. When ordering always state whether **Right** or **Left** hand cut is wanted. Be sure to state the shank number wanted.

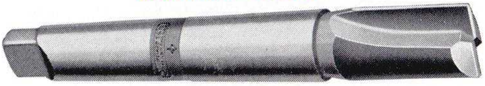
*Always Give List Number When Ordering*

# High Speed Two Lipped Slotting End Mills

## with Brown & Sharpe Shanks

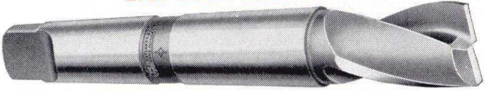
### Straight Flute—List No. 678

Code Word—LUKOT



### Spiral Flute—List No. 679

Code Word—LUKPAIL



These End Mills are furnished as regular with either right or left hand cut, straight or spiral flute. Right Hand Mills have right hand spiral flutes, and Left Hand Mills left hand spiral flutes.

Mills with No. 5 shanks are regularly furnished without tangs. Mills with No. 9 shanks are furnished either with tang end or shank tapped for draw-in bolt, as desired, at prices quoted below. For draw-in bolt, tapped hole in shank will be ⅝″-11 N. C. right hand Class 2 fit. Minimum length of full thread ¾″.

Unless otherwise specified, mills with No. 9 shanks will be furnished with tang end.

| Diameter Inches | Price Each | Length of Cut Inches | Length Overall Inches | Shank Taper No. |
|---|---|---|---|---|
| ¼ | $3.40 | ⅜ | 2 9/16 | 5 |
| ¼ | 5.30 | ⅜ | 4⅜ | 7 |
| 5/16 | 3.40 | 15/32 | 2 21/32 | 5 |
| 5/16 | 5.30 | 15/32 | 4 15/32 | 7 |
| ⅜ | 5.40 | 9/16 | 4 9/16 | 7 |
| 7/16 | 5.40 | 21/32 | 4 21/32 | 7 |
| ½ | 5.40 | ¾ | 4¾ | 7 |
| ⅝ | 5.60 | 15/16 | 4 15/16 | 7 |
| ¾ | 5.80 | 1⅛ | 5⅛ | 7 |
| ⅞ | 6.70 | 1 5/16 | 5 5/16 | 7 |
| 1 | 7.90 | 1½ | 6¾ | 9 |
| 1¼ | 11.60 | 1⅞ | 7⅛ | 9 |
| 1½ | 14.60 | 2¼ | 7½ | 9 |

End Mills having dimensions other than listed are special and subject to special prices. When ordering always state whether **Right** or **Left** hand cut is wanted. Be sure to state the shank number wanted.

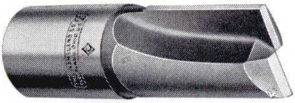
***Always Give List Number When Ordering***

# High Speed Two Lipped Slotting End Mills

### with Straight Shanks

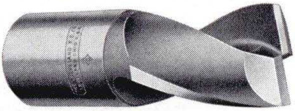
## Straight Flute—List No. 680

Code Word—LUKPAR



## Spiral Flute—List No. 681

Code Word--LUKPATE



**These End Mills are furnished as regular with either right or left hand cut, straight or spiral flutes. Right Hand Mills have right hand spiral flutes, and Left Hand Mills left hand spiral flutes.**

**The diameter of the shank is the same as the diameter of cut.**

| Diameter Inches | Price Each | Length of Cut Inches | Length Overall Inches |
|---|---|---|---|
| 1/4 | $1.90 | 3/8 | 1 7/16 |
| 5/16 | 2.10 | 15/32 | 1 9/16 |
| 3/8 | 2.20 | 9/16 | 1 5/8 |
| 7/16 | 2.40 | 21/32 | 2 |
| 1/2 | 2.80 | 3/4 | 2 1/16 |
| 5/8 | 3.30 | 15/16 | 2 5/16 |
| 3/4 | 3.60 | 1 1/8 | 2 1/2 |

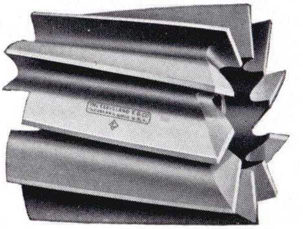
End Mills having dimensions other than listed are special and subject to special prices. When ordering always state whether **Right** or **Left** hand cut is wanted.

***Always Give List Number When Ordering***

# Coarse Tooth Spiral-Fluted Shell End Mills

## High Speed Steel—List No. 671

### Code Word—LUG



**These End Mills are furnished as regular with either right or left hand cut, spiral flutes only. Right Hand Mills have right hand spiral flutes, and Left Hand Mills left hand spiral flutes. These mills have straight arbor holes.**

**These mills conform to the National standard dimensions adopted by the Simplified Practice Committee on Milling Cutters.**

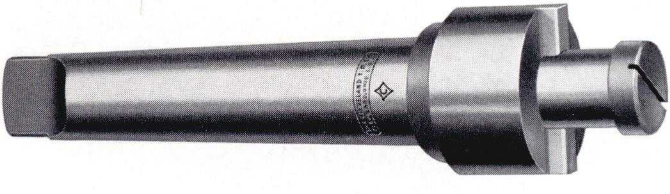
| Diameter Inches | Price Each | Length of Cut Inches | Size Hole Inches | Size of Driving Slots Inches | |
|---|---|---|---|---|---|
| | | | | Width | Depth |
| 1¼ | $5.40 | 1 | ½ | ¼ | 5/32 |
| 1½ | 6.00 | 1⅛ | ½ | ¼ | 5/32 |
| 1¾ | 6.70 | 1¼ | ¾ | 5/16 | 3/16 |
| 2 | 7.70 | 1⅜ | ¾ | 5/16 | 3/16 |
| 2¼ | 9.00 | 1½ | 1 | ⅜ | 7/32 |
| 2½ | 10.70 | 1⅝ | 1 | ⅜ | 7/32 |
| 2¾ | 12.10 | 1⅝ | 1 | ⅜ | 7/32 |
| 3 | 14.20 | 1¾ | 1¼ | ½ | 9/32 |
| 3½ | 19.20 | 1⅞ | 1¼ | ½ | 9/32 |

End Mills having dimensions other than listed are special and subject to special prices. When ordering always state whether **Right** or **Left** hand cut is wanted.

*Always Give List Number When Ordering*

# Arbors for Shell End Mills

## With Brown & Sharpe Shanks



## List No. 196

**Code Word—LANDTASTE**

| Size Arbor No. | Price Each | Fitting Sizes of End Mills | Shank Taper No. |
|---|---|---|---|
| 1 | $8.00 | 1¼ to 1½ | 7 |
| 2 | 8.00 | 1¾ to 2 | 9 |
| 3 | 9.75 | 2¼ to 2¾ | 10 |
| 4 | 10.50 | 3 to 3½ | 11 |

In ordering, state whether arbor is desired for Right-Hand or Left-Hand Mill.

When desired these arbors will be furnished with the shank tapped for draw-in bolt. Specify size of tapped hole required; also form of thread and whether right or left-hand thread.

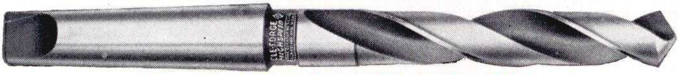
This arbor for mills with straight holes.

***Always Give List Number When Ordering***

# CLE-FORGE HIGH SPEED DRILLS

TRADE MARK REG. U.S. PAT. OFF.

## Millimeter Sizes—Taper Shank



## Shanks Regular—List No. 943

Code Word—MALICE

## Shanks Smaller than Regular—List No. 945

Code Word—MALLOW

| Diameter Inches | List No. 943 Shanks Regular | | | List No. 945 Shanks Smaller | | |
|---|---|---|---|---|---|---|
| | Price Each | Length Overall m/m | Shank Taper No. | Price Each | Length Overall m/m | Shank Taper No. |
| 3 | $ 1.00 | 130 | 1 | ...... | ...... | ...... |
| 3.5 | 1.10 | 136 | 1 | ...... | ...... | ...... |
| 4 | 1.15 | 136 | 1 | ...... | ...... | ...... |
| 4.5 | 1.25 | 146 | 1 | ...... | ...... | ...... |
| 5 | 1.35 | 152 | 1 | ...... | ...... | ...... |
| 5.5 | 1.35 | 152 | 1 | ...... | ...... | ...... |
| 6 | 1.40 | 155 | 1 | ...... | ...... | ...... |
| 6.5 | 1.45 | 155 | 1 | ...... | ...... | ...... |
| 7 | 1.50 | 159 | 1 | ...... | ...... | ...... |
| 7.5 | 1.60 | 162 | 1 | ...... | ...... | ...... |
| 8 | 1.70 | 162 | 1 | ...... | ...... | ...... |
| 8.5 | 1.70 | 165 | 1 | ...... | ...... | ...... |
| 9 | 1.90 | 171 | 1 | ...... | ...... | ...... |
| 9.5 | 1.90 | 171 | 1 | ...... | ...... | ...... |
| 10 | 2.10 | 178 | 1 | ...... | ...... | ...... |
| 10.5 | 2.30 | 184 | 1 | ...... | ...... | ...... |
| 11 | 2.30 | 184 | 1 | ...... | ...... | ...... |
| 11.5 | 2.50 | 190 | 1 | ...... | ...... | ...... |
| 12 | 2.70 | 190 | 1 | ...... | ...... | ...... |
| 12.5 | 2.95 | 210 | 2 | $ 2.75 | 197 | 1 |
| 13 | 3.25 | 216 | 2 | 3.05 | 203 | 1 |
| 13.5 | 3.65 | 216 | 2 | 3.40 | 203 | 1 |
| 14 | 3.75 | 222 | 2 | 3.50 | 210 | 1 |
| 14.5 | 4.00 | 222 | 2 | ...... | ...... | ...... |
| 15 | 4.00 | 222 | 2 | ...... | ...... | ...... |
| 15.5 | 4.25 | 222 | 2 | ...... | ...... | ...... |
| 16 | 4.60 | 222 | 2 | ...... | ...... | ...... |
| 16.5 | 4.75 | 229 | 2 | ...... | ...... | ...... |
| 17 | 5.25 | 235 | 2 | ...... | ...... | ...... |
| 17.5 | 5.75 | 235 | 2 | ...... | ...... | ...... |
| 18 | 5.75 | 241 | 2 | ...... | ...... | ...... |
| 18.5 | 6.25 | 248 | 2 | ...... | ...... | ...... |
| 19 | 6.25 | 248 | 2 | ...... | ...... | ...... |
| 19.5 | 6.50 | 251 | 2 | ...... | ...... | ...... |
| 20 | 7.25 | 273 | 3 | 6.75 | 254 | 2 |
| 20.5 | 7.25 | 273 | 3 | 6.75 | 254 | 2 |
| 21 | 7.65 | 273 | 3 | 7.15 | 254 | 2 |
| 21.5 | 8.05 | 273 | 3 | 7.50 | 254 | 2 |

Continued on next page

# CLE◆FORGE HIGH SPEED DRILLS

TRADE MARK REG. U.S. PAT. OFF.

## Millimeter Sizes—Taper Shank

CLE-FORGE HIGH SPEED

### Shanks Regular—List No. 943

Code Word—MALICE

### Shanks Smaller than Regular—List No. 945

Code Word—MALLOW

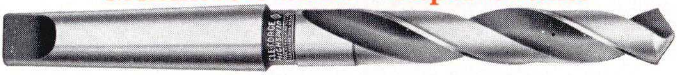
| Diameter Inches | List No. 943 Shanks Regular Price Each | List No. 943 Shanks Regular Length Overall m/m | List No. 943 Shanks Regular Shank Taper No. | List No. 945 Shanks Smaller Price Each | List No. 945 Shanks Smaller Length Overall m/m | List No. 945 Shanks Smaller Shank Taper No. |
|---|---|---|---|---|---|---|
| 22 | $ 8.05 | 273 | 3 | $ 7.50 | 254 | 2 |
| 22.5 | 8.45 | 273 | 3 | 7.85 | 254 | 2 |
| 23 | 8.45 | 273 | 3 | 7.85 | 254 | 2 |
| 23.5 | 8.85 | 273 | 3 | ...... | ...... | ...... |
| 24 | 9.65 | 279 | 3 | ...... | ...... | ...... |
| 24.5 | 9.65 | 279 | 3 | ...... | ...... | ...... |
| 25 | 10.25 | 279 | 3 | ...... | ...... | ...... |
| 25.5 | 11.00 | 279 | 3 | ...... | ...... | ...... |
| 26 | 11.00 | 283 | 3 | ...... | ...... | ...... |
| 26.5 | 11.75 | 286 | 3 | ...... | ...... | ...... |
| 27 | 12.20 | 286 | 3 | ...... | ...... | ...... |
| 27.5 | 13.25 | 317 | 4 | 12.20 | 292 | 3 |
| 28 | 14.25 | 324 | 4 | 13.15 | 298 | 3 |
| 28.5 | 14.25 | 324 | 4 | 13.15 | 298 | 3 |
| 29 | 15.00 | 327 | 4 | 13.85 | 301 | 3 |
| 29.5 | 15.75 | 330 | 4 | 14.55 | 301 | 3 |
| 30 | 15.75 | 330 | 4 | 14.55 | 305 | 3 |
| 30.5 | 16.50 | 333 | 4 | 15.25 | 308 | 3 |
| 31 | 18.00 | 333 | 4 | 16.65 | 308 | 3 |
| 31.5 | 18.00 | 343 | 4 | 16.65 | 317 | 3 |
| 32 | 20.00 | 359 | 4 | ...... | ...... | ...... |
| 32.5 | 20.00 | 359 | 4 | ...... | ...... | ...... |
| 33 | 20.75 | 362 | 4 | ...... | ...... | ...... |
| 33.5 | 21.50 | 365 | 4 | ...... | ...... | ...... |
| 34 | 21.50 | 365 | 4 | ...... | ...... | ...... |
| 34.5 | 22.25 | 368 | 4 | ...... | ...... | ...... |
| 35 | 23.00 | 368 | 4 | ...... | ...... | ...... |
| 35.5 | 23.00 | 372 | 4 | ...... | ...... | ...... |
| 36 | 23.75 | 375 | 4 | ...... | ...... | ...... |
| 36.5 | 23.75 | 375 | 4 | ...... | ...... | ...... |
| 37 | 24.50 | 378 | 4 | ...... | ...... | ...... |
| 37.5 | 25.25 | 381 | 4 | ...... | ...... | ...... |
| 38 | 25.25 | 381 | 4 | ...... | ...... | ...... |
| 38.5 | 28.75 | 416 | 5 | 26.35 | 381 | 4 |
| 39 | 30.75 | 422 | 5 | 28.20 | 381 | 4 |
| 39.5 | 30.75 | 422 | 5 | 28.20 | 387 | 4 |
| 40 | 32.75 | 428 | 5 | 30.10 | 394 | 4 |
| 40.5 | 34.00 | 428 | 5 | 31.25 | 394 | 4 |
| 41 | 34.00 | 431 | 5 | 31.25 | 397 | 4 |

Continued on next page

# CLE-FORGE HIGH SPEED DRILLS

TRADE MARK REG. U.S. PAT. OFF.

## Millimeter Sizes—Taper Shank



## Shanks Regular—List No. 943

Code Word—MALICE

## Shanks Smaller than Regular—List No. 945

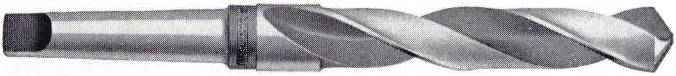
Code Word—MALLOW

| Diameter Inches | List No. 943 Shanks Regular | | | List No. 945 Shanks Smaller | | |
|---|---|---|---|---|---|---|
| | Price Each | Length Overall m/m | Shank Taper No. | Price Each | Length Overall m/m | Shank Taper No. |
| 41.5 | $ 35.25 | 435 | 5 | $ 32.40 | 400 | 4 |
| 42 | 35.25 | 435 | 5 | 32.40 | 400 | 4 |
| 42.5 | 36.50 | 435 | 5 | 33.55 | 400 | 4 |
| 43 | 37.75 | 435 | 5 | 34.70 | 400 | 4 |
| 43.5 | 37.75 | 435 | 5 | 34.70 | 400 | 4 |
| 44 | 39.00 | 435 | 5 | 37.00 | 413 | 4 |
| 44.5 | 40.25 | 435 | 5 | 38.20 | 413 | 4 |
| 45 | 40.25 | 435 | 5 | 38.20 | 413 | 4 |
| 46 | 41.50 | 435 | 5 | 39.40 | 413 | 4 |
| 47 | 45.00 | 441 | 5 | 42.75 | 419 | 4 |
| 48 | 46.25 | 441 | 5 | 43.95 | 419 | 4 |
| 49 | 47.50 | 441 | 5 | 45.45 | 422 | 4 |
| 50 | 48.75 | 441 | 5 | 46.65 | 422 | 4 |
| 51 | 51.75 | 441 | 5 | ...... | ...... | ...... |
| 52 | 53.50 | 441 | 5 | ...... | ...... | ...... |
| 53 | 55.25 | 441 | 5 | ...... | ...... | ...... |
| 54 | 58.75 | 441 | 5 | ...... | ...... | ...... |
| 55 | 60.50 | 441 | 5 | ...... | ...... | ...... |
| 56 | 62.25 | 441 | 5 | ...... | ...... | ...... |
| 57 | 64.00 | 441 | 5 | ...... | ...... | ...... |
| 58 | 67.50 | 441 | 5 | ...... | ...... | ...... |
| 59 | 71.00 | 441 | 5 | ...... | ...... | ...... |
| 60 | 71.00 | 441 | 5 | ...... | ...... | ...... |
| 61 | 87.50 | 476 | 5 | ...... | ...... | ...... |
| 62 | 91.00 | 476 | 5 | ...... | ...... | ...... |
| 63 | 91.00 | 476 | 5 | ...... | ...... | ...... |
| 64 | 100.00 | 495 | 5 | ...... | ...... | ...... |
| 65 | 100.00 | 495 | 5 | ...... | ...... | ...... |
| 66 | 105.00 | 495 | 5 | ...... | ...... | ...... |
| 67 | 110.55 | 495 | 5 | ...... | ...... | ...... |
| 68 | 115.50 | 517 | 5 | ...... | ...... | ...... |
| 69 | 120.50 | 517 | 5 | ...... | ...... | ...... |
| 70 | 125.65 | 517 | 5 | ...... | ...... | ...... |
| 71 | 129.50 | 537 | 5 | ...... | ...... | ...... |
| 72 | 135.00 | 537 | 5 | ...... | ...... | ...... |
| 73 | 135.00 | 537 | 5 | ...... | ...... | ...... |
| 74 | 142.50 | 552 | 5 | ...... | ...... | ...... |
| 75 | 150.00 | 552 | 5 | ...... | ...... | ...... |
| 76 | 150.00 | 552 | 5 | ...... | ...... | ...... |

# Millimeter Size—Taper Shank Drills

## Carbon Steel No. 1152

**Code Word—MIMIC**



| Diameter m/m | Price Each | Length Overall m/m | Shank Taper | Diameter m/m | Price Each | Length Overall m/m | Shank Taper |
|---|---|---|---|---|---|---|---|
| 3 | $.45 | 130 | No. 1 | 17½ | $1.90 | 235 | No. 2 |
| 3½ | .45 | 136 | | 18 | 1.90 | 241 | |
| 4 | .50 | 136 | | 18½ | 2.00 | 248 | |
| 4½ | .50 | 146 | | 19 | 2.00 | 248 | |
| 5 | .55 | 152 | | 19½ | 2.10 | 251 | |
| 5½ | .55 | 152 | | 20 | 2.20 | 254 | |
| 6 | .60 | 155 | | 20½ | 2.20 | 254 | |
| 6½ | .65 | 155 | | 21 | 2.40 | 254 | |
| 7 | .65 | 159 | | 21½ | 2.60 | 254 | |
| 7½ | .70 | 162 | | 22 | 2.60 | 254 | |
| 8 | .75 | 162 | | 22½ | 2.80 | 254 | |
| 8½ | .75 | 165 | | 23 | 2.80 | 254 | |
| 9 | .80 | 171 | | | | | |
| 9½ | .80 | 171 | | 23½ | 3.00 | 273 | No. 3 |
| 10 | .90 | 178 | | 24 | 3.25 | 279 | |
| 10½ | 1.00 | 184 | | 24½ | 3.25 | 279 | |
| 11 | 1.00 | 184 | | 25 | 3.50 | 279 | |
| 11½ | 1.10 | 190 | | 25½ | 3.75 | 279 | |
| 12 | 1.20 | 190 | | 26 | 3.75 | 283 | |
| 12½ | 1.20 | 197 | | 26½ | 4.00 | 286 | |
| 13 | 1.30 | 203 | | 27 | 4.25 | 286 | |
| 13½ | 1.40 | 203 | | 27½ | 4.25 | 292 | |
| 14 | 1.40 | 210 | | 28 | 4.50 | 298 | |
| | | | | 28½ | 4.50 | 298 | |
| 14½ | 1.50 | 222 | No. 2 | 29 | 4.75 | 301 | |
| 15 | 1.50 | 222 | | 29½ | 5.00 | 301 | |
| 15½ | 1.60 | 222 | | 30 | 5.00 | 305 | |
| 16 | 1.70 | 222 | | 30½ | 5.25 | 308 | |
| 16½ | 1.70 | 229 | | 31 | 5.50 | 308 | |
| 17 | 1.80 | 235 | | 31½ | 5.50 | 317 | |

**Continued on next page**

# Millimeter Size—Taper Shank Drills

## Carbon Steel No. 1152

**Code Word—MIMIC**

| Diameter m/m | Price Each | Length Overall m/m | Shank Taper | Diameter m/m | Price Each | Length Overall m/m | Shank Taper |
|---|---|---|---|---|---|---|---|
| 32 | $ 5.75 | 359 | No. 4 | 49 | $17.00 | 422 | No. 4 |
| 32½ | 5.75 | 359 | | 50 | 17.75 | 422 | |
| 33 | 6.00 | 362 | | | | | |
| 33½ | 6.25 | 365 | | | | | |
| 34 | 6.25 | 365 | | 51 | 19.25 | 441 | No. 5 |
| 34½ | 6.50 | 368 | | 52 | 20.00 | 441 | |
| 35 | 7.00 | 368 | | 53 | 20.75 | 441 | |
| 35½ | 7.00 | 372 | | 54 | 22.25 | 441 | |
| 36 | 7.50 | 375 | | 55 | 23.00 | 441 | |
| 36½ | 7.50 | 375 | | 56 | 23.75 | 441 | |
| 37 | 8.00 | 378 | | 57 | 24.50 | 441 | |
| 37½ | 8.50 | 381 | | 58 | 26.00 | 441 | |
| 38 | 8.50 | 381 | | 59 | 26.75 | 441 | |
| 38½ | 9.00 | 381 | | 60 | 27.50 | 441 | |
| 39 | 9.50 | 381 | | 61 | 28.25 | 476 | |
| 39½ | 9.50 | 387 | | 62 | 29.75 | 476 | |
| 40 | 10.00 | 394 | | 63 | 30.50 | 476 | |
| 40½ | 10.50 | 394 | | 64 | 31.25 | 495 | |
| 41 | 10.50 | 397 | | 65 | 32.00 | 495 | |
| 41½ | 11.00 | 400 | | 66 | 34.00 | 495 | |
| 42 | 11.00 | 400 | | 67 | 35.00 | 495 | |
| 42½ | 11.50 | 400 | | 68 | 36.00 | 517 | |
| 43 | 12.00 | 400 | | 69 | 37.00 | 517 | |
| 43½ | 12.00 | 400 | | 70 | 39.25 | 517 | |
| 44 | 12.50 | 413 | | 71 | 40.50 | 537 | |
| 44½ | 13.25 | 413 | | 72 | 41.75 | 537 | |
| 45 | 13.25 | 413 | | 73 | 43.00 | 537 | |
| 46 | 14.00 | 413 | | 74 | 45.50 | 552 | |
| 47 | 15.50 | 419 | | 75 | 46.75 | 552 | |
| 48 | 16.25 | 419 | | 76 | 48.00 | 552 | |

*Always Give List Number When Ordering*

# Millimeter Size—Straight Shank Drills
# Long Set

## CLE-FORGE HIGH SPEED DRILLS

TRADE MARK REG. U.S. PAT. OFF.

**Carbon Steel No. 1153**
Code Word—MINCING

**High Speed Steel No. 954**
Code Word—MANGLE

CLE-FORGE HIGH SPEED

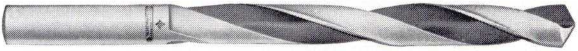
| Diameter m/m | Price Each | | Length Overall m/m | Diameter m/m | Price Each | | Length Overall m/m |
|---|---|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | Carbon Steel | High Speed | |
| 3 | $ .45 | $ 1.00 | 130 | 22 | $ 2.60 | $ 7.50 | 254 |
| 3½ | .45 | 1.10 | 136 | 22½ | 2.80 | 7.85 | 254 |
| 4 | .50 | 1.15 | 136 | 23 | 2.80 | 7.85 | 254 |
| 4½ | .50 | 1.25 | 146 | 23½ | 3.00 | 8.85 | 273 |
| 5 | .55 | 1.35 | 152 | 24 | 3.25 | 9.65 | 279 |
| 5½ | .55 | 1.35 | 152 | 24½ | 3.25 | 9.65 | 279 |
| 6 | .60 | 1.40 | 155 | 25 | 3.50 | 10.25 | 279 |
| 6½ | .65 | 1.45 | 155 | 25½ | 3.75 | 11.00 | 279 |
| 7 | .65 | 1.50 | 159 | 26 | 3.75 | 11.00 | 283 |
| 7½ | .70 | 1.60 | 162 | 26½ | 4.00 | 11.75 | 286 |
| 8 | .75 | 1.70 | 162 | 27 | 4.25 | 12.20 | 286 |
| 8½ | .75 | 1.70 | 165 | 27½ | 4.25 | 12.20 | 292 |
| 9 | .80 | 1.90 | 171 | 28 | 4.50 | 13.15 | 298 |
| 9½ | .80 | 1.90 | 171 | 28½ | 4.50 | 13.15 | 298 |
| 10 | .90 | 2.10 | 178 | 29 | 4.75 | 13.85 | 301 |
| 10½ | 1.00 | 2.30 | 184 | 29½ | 5.00 | 14.55 | 301 |
| 11 | 1.00 | 2.30 | 184 | 30 | 5.00 | 14.55 | 305 |
| 11½ | 1.10 | 2.50 | 190 | 31 | 5.50 | 16.65 | 308 |
| 12 | 1.20 | 2.70 | 190 | 32 | 5.75 | 20.00 | 359 |
| 12½ | 1.20 | 2.75 | 197 | 33 | 6.00 | 20.75 | 362 |
| 13 | 1.30 | 3.05 | 203 | 34 | 6.25 | 21.50 | 365 |
| 13½ | 1.40 | 3.40 | 203 | 35 | 7.00 | 23.00 | 368 |
| 14 | 1.40 | 3.50 | 210 | 36 | 7.50 | 23.75 | 375 |
| 14½ | 1.50 | 4.00 | 222 | 37 | 8.00 | 24.50 | 378 |
| 15 | 1.50 | 4.00 | 222 | 38 | 8.50 | 25.25 | 381 |
| 15½ | 1.60 | 4.25 | 222 | 39 | 9.50 | 28.20 | 381 |
| 16 | 1.70 | 4.60 | 222 | 40 | 10.00 | 30.10 | 394 |
| 16½ | 1.70 | 4.75 | 229 | 41 | 10.50 | 31.25 | 397 |
| 17 | 1.80 | 5.25 | 235 | 42 | 11.00 | 32.40 | 400 |
| 17½ | 1.90 | 5.75 | 235 | 43 | 12.00 | 34.70 | 400 |
| 18 | 1.90 | 5.75 | 241 | 44 | 12.50 | 37.00 | 413 |
| 18½ | 2.00 | 6.25 | 248 | 45 | 13.25 | 38.20 | 413 |
| 19 | 2.00 | 6.25 | 248 | 46 | 14.00 | 39.40 | 413 |
| 19½ | 2.10 | 6.50 | 251 | 47 | 15.50 | 42.75 | 419 |
| 20 | 2.20 | 6.75 | 254 | 48 | 16.25 | 43.95 | 419 |
| 20½ | 2.20 | 6.75 | 254 | 49 | 17.00 | 45.45 | 422 |
| 21 | 2.40 | 7.15 | 254 | 50 | 17.75 | 46.65 | 422 |
| 21½ | 2.60 | 7.50 | 254 | | | | |

# Millimeter Size—Straight Shank Drills
## Short Set

### Carbon Steel List No. 1154
**Code Word—MINISTER**

### CLE-FORGE HIGH SPEED DRILLS
TRADE MARK REG. U. S. PAT. OFF.

### List No. 920
**Code Word—MADDER**



| Diameter m/m | Price per Dozen | | Length Overall m/m | Diameter m/m | Price per Dozen | | Length Overall m/m |
|---|---|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | Carbon Steel | High Speed | |
| .5 | $1.50 | $4.25 | 25 | 3. | $1.75 | $3.30 | 70 |
| .6 | 1.50 | 4.25 | 30 | 3.1 | 1.75 | 3.30 | 70 |
| .7 | 1.50 | 3.50 | 33 | 3.2 | 1.80 | 3.60 | 71 |
| .75 | 1.50 | 3.50 | 35 | 3.25 | 1.80 | 3.60 | 71 |
| .8 | 1.50 | 3.50 | 37 | 3.3 | 1.80 | 3.60 | 71 |
| .9 | 1.50 | 3.50 | 38 | 3.4 | 1.80 | 3.60 | 71 |
| 1. | 1.50 | 3.50 | 38 | 3.5 | 1.80 | 3.60 | 71 |
| 1.1 | 1.55 | 2.40 | 43 | 3.6 | 1.80 | 3.60 | 73 |
| 1.2 | 1.55 | 2.40 | 43 | 3.7 | 1.80 | 3.90 | 75 |
| 1.25 | 1.55 | 2.40 | 43 | 3.75 | 1.80 | 3.90 | 75 |
| 1.3 | 1.60 | 2.40 | 44 | 3.8 | 1.90 | 3.90 | 76 |
| 1.4 | 1.60 | 2.40 | 46 | 3.9 | 1.90 | 4.05 | 78 |
| 1.5 | 1.60 | 2.40 | 46 | 4. | 1.90 | 4.15 | 79 |
| 1.6 | 1.60 | 2.40 | 48 | 4.1 | 2.00 | 4.35 | 81 |
| 1.7 | 1.60 | 2.40 | 49 | 4.2 | 2.00 | 4.35 | 83 |
| 1.75 | 1.60 | 2.40 | 49 | 4.25 | 2.00 | 4.35 | 83 |
| 1.8 | 1.65 | 2.40 | 49 | 4.3 | 2.00 | 4.50 | 84 |
| 1.9 | 1.65 | 2.50 | 52 | 4.4 | 2.00 | 4.65 | 84 |
| 2. | 1.65 | 2.50 | 52 | 4.5 | 2.00 | 4.85 | 86 |
| 2.1 | 1.70 | 2.60 | 56 | 4.6 | 2.25 | 4.85 | 87 |
| 2.2 | 1.70 | 2.60 | 56 | 4.7 | 2.25 | 4.85 | 89 |
| 2.25 | 1.70 | 2.60 | 57 | 4.75 | 2.25 | 4.85 | 89 |
| 2.3 | 1.70 | 2.60 | 57 | 4.8 | 2.25 | 5.25 | 90 |
| 2.4 | 1.70 | 2.80 | 59 | 4.9 | 2.50 | 5.25 | 92 |
| 2.5 | 1.75 | 2.80 | 60 | 5. | 2.50 | 5.45 | 94 |
| 2.6 | 1.75 | 2.95 | 62 | 5.1 | 2.50 | 5.45 | 95 |
| 2.7 | 1.75 | 3.10 | 65 | 5.2 | 2.50 | 5.95 | 97 |
| 2.75 | 1.75 | 3.10 | 65 | 5.25 | 2.75 | 5.95 | 97 |
| 2.8 | 1.75 | 3.15 | 65 | 5.3 | 2.75 | 5.95 | 98 |
| 2.9 | 1.75 | 3.30 | 68 | 5.4 | 2.75 | 5.95 | 98 |

**Continued on next page**

*Always Give List Number When Ordering*

# Millimeter Size—Straight Shank Drills Short Set

## Carbon Steel List No. 1154

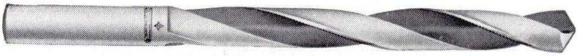
**Code Word—MINISTER**

## CLE-FORGE HIGH SPEED DRILLS

TRADE MARK REG. U. S. PAT. OFF.

## List No. 920

**Code Word—MADDER**



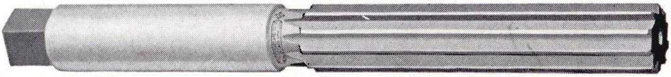
| Diameter m/m | Price per Dozen | | Length Overall m/m | Diameter m/m | Price per Dozen | | Length Overall m/m |
|---|---|---|---|---|---|---|---|
| | Carbon Steel | High Speed | | | Carbon Steel | High Speed | |
| 5.5 | $2.75 | $5.95 | 98 | 8.1 | $4.40 | $10.45 | 114 |
| 5.6 | 2.75 | 6.25 | 98 | 8.2 | 4.60 | 10.75 | 117 |
| 5.7 | 2.75 | 6.25 | 98 | 8.25 | 4.60 | 10.75 | 117 |
| 5.75 | 2.75 | 6.25 | 98 | 8.3 | 4.70 | 10.75 | 117 |
| 5.8 | 2.75 | 6.25 | 98 | 8.4 | 4.75 | 11.75 | 121 |
| 5.9 | 3.00 | 6.25 | 98 | 8.5 | 4.75 | 11.75 | 121 |
| 6. | 3.05 | 6.55 | 98 | 8.6 | 5.00 | 11.75 | 121 |
| 6.1 | 3.10 | 6.55 | 98 | 8.7 | 5.05 | 11.75 | 121 |
| 6.2 | 3.15 | 6.75 | 102 | 8.75 | 5.05 | 11.75 | 121 |
| 6.25 | 3.15 | 6.75 | 102 | 8.8 | 5.15 | 12.75 | 124 |
| 6.3 | 3.25 | 6.75 | 102 | | | | |
| 6.4 | 3.25 | 7.25 | 102 | 8.9 | 5.15 | 12.75 | 124 |
| 6.5 | 3.35 | 7.50 | 105 | 9. | 5.50 | 12.75 | 124 |
| 6.6 | 3.45 | 7.50 | 105 | 9.1 | 5.50 | 12.75 | 124 |
| 6.7 | 3.45 | 7.50 | 105 | 9.2 | 5.50 | 13.40 | 124 |
| 6.75 | 3.50 | 7.50 | 105 | 9.25 | 5.50 | 13.75 | 127 |
| 6.8 | 3.50 | 8.00 | 105 | 9.3 | 5.50 | 13.75 | 127 |
| 6.9 | 3.65 | 8.00 | 105 | 9.4 | 6.00 | 13.75 | 127 |
| 7. | 3.70 | 8.00 | 105 | 9.5 | 6.00 | 13.75 | 127 |
| 7.1 | 3.80 | 8.25 | 108 | 9.6 | 6.00 | 14.65 | 127 |
| 7.2 | 3.80 | 8.75 | 108 | 9.7 | 6.50 | 15.00 | 130 |
| 7.25 | 3.80 | 8.75 | 108 | 9.75 | 6.50 | 15.00 | 130 |
| 7.3 | 3.80 | 8.75 | 108 | 9.8 | 6.50 | 15.00 | 130 |
| 7.4 | 3.90 | 8.75 | 108 | 9.9 | 6.50 | 15.00 | 130 |
| 7.5 | 4.00 | 9.00 | 111 | 10. | 6.75 | 15.85 | 130 |
| 7.6 | 4.00 | 9.50 | 111 | 10.5 | 7.25 | 17.10 | 133 |
| 7.7 | 4.25 | 9.50 | 111 | 11. | 8.50 | 18.75 | 140 |
| 7.75 | 4.25 | 9.50 | 111 | 11.5 | 9.25 | 20.00 | 143 |
| 7.8 | 4.25 | 9.50 | 111 | 12. | 10.00 | 22.25 | 146 |
| 7.9 | 4.35 | 9.75 | 114 | 12.5 | 11.00 | 24.25 | 150 |
| 8. | 4.40 | 10.45 | 114 | 13. | 12.00 | 26.50 | 152 |

***Always Give List Number When Ordering***

# Millimeter Size—Reamers

## Hand Reamers—List No. 1196

**Code Word—MISSILE**



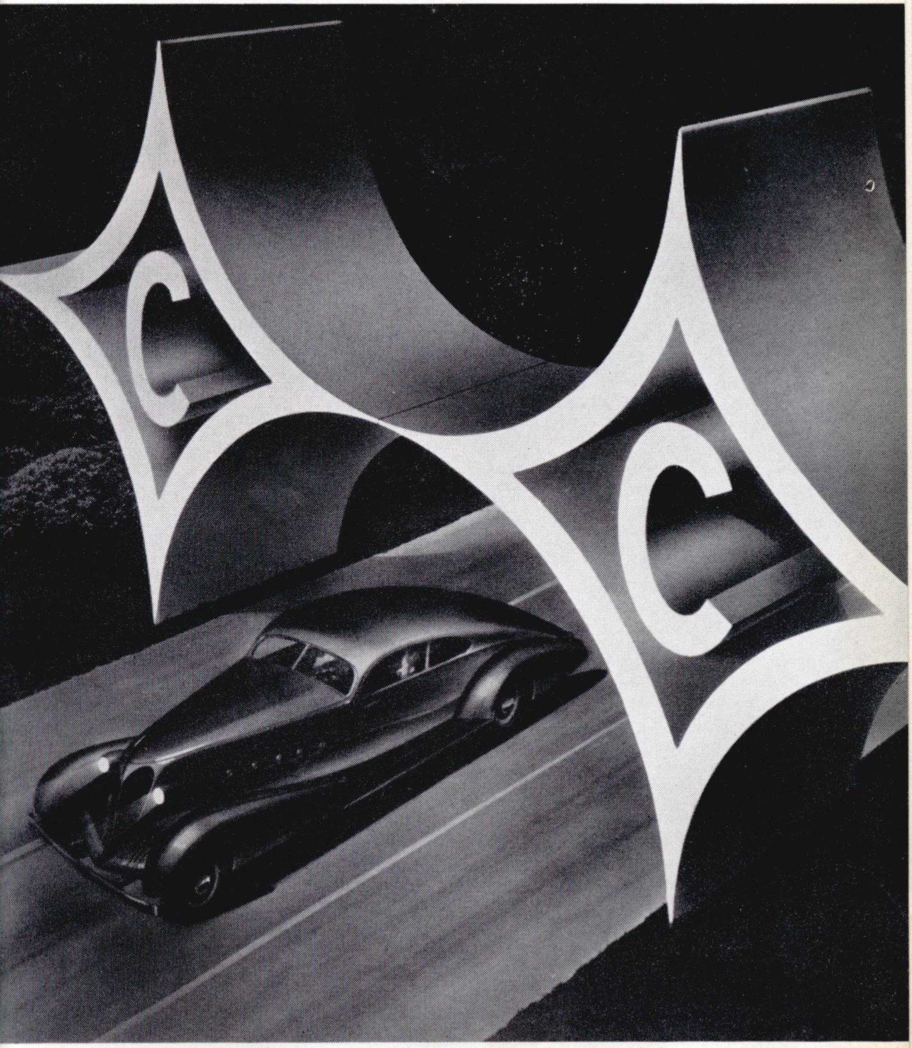
(Eccentric Flutes)

**Hand reamers with spiral flutes or threaded ends and sizes and dimensions not listed are special.**

| Diameter m/m | Price Each | Length of Flute m/m | Length Overall m/m |
|---|---|---|---|
| 3 | $1.00 | 38 | 76 |
| 3½ | 1.20 | 39½ | 79 |
| 4 | 1.20 | 41 | 82 |
| 4½ | 1.20 | 44½ | 89 |
| 5 | 1.40 | 46 | 92 |
| 5½ | 1.40 | 47½ | 95 |
| 6 | 1.40 | 51 | 102 |
| 6½ | 1.50 | 52½ | 105 |
| 7 | 1.50 | 54 | 108 |
| 7½ | 1.50 | 56 | 112 |
| 8 | 1.60 | 58½ | 117 |
| 8½ | 1.60 | 60½ | 121 |
| 9 | 1.60 | 62 | 124 |
| 9½ | 1.60 | 63½ | 127 |
| 10 | 1.75 | 66½ | 133 |
| 10½ | 1.75 | 68 | 136 |
| 11 | 1.75 | 70 | 140 |
| 11½ | 1.90 | 71½ | 143 |
| 12 | 1.90 | 74½ | 149 |
| 13 | 2.00 | 77½ | 155 |
| 14 | 2.00 | 82½ | 165 |
| 15 | 2.20 | 85½ | 171 |
| 16 | 2.40 | 91 | 182 |
| 17 | 2.40 | 95 | 190 |
| 18 | 2.60 | 103 | 206 |
| 19 | 2.60 | 106½ | 213 |
| 20 | 2.80 | 113 | 226 |
| 21 | 3.10 | 116½ | 233 |
| 22 | 3.10 | 123 | 246 |
| 23 | 3.40 | 128 | 256 |
| 24 | 3.70 | 133½ | 267 |
| 25 | 3.70 | 138 | 274 |

*Always Give List Number When Ordering*

# MECHANICAL DATA

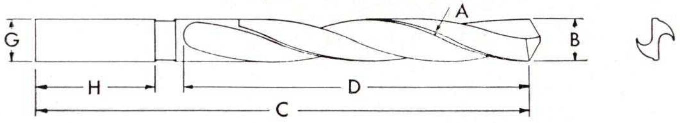


**FOR ALPHABETICAL INDEX, SEE PAGES 221-229**

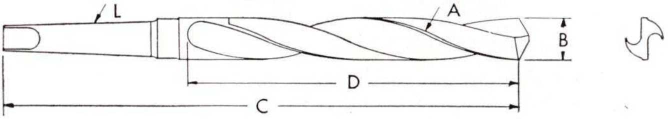
**FOR NUMERICAL INDEX, SEE PAGES 230-240**

# Suggestions for Ordering

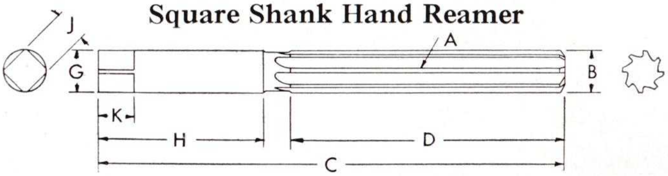
## Straight Shank Drill



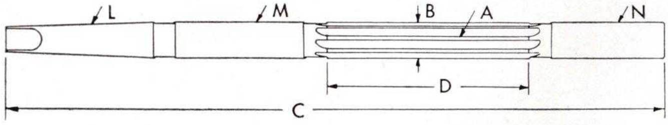
## Taper Shank Drill



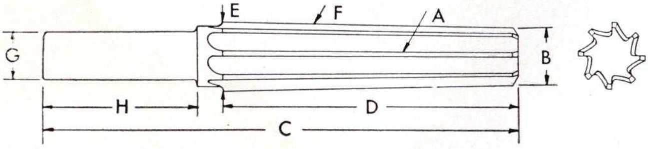
## Square Shank Hand Reamer



## Taper Shank Machine Reamer with Pilot and Guide



## Straight Shank Taper Reamer



# Suggestions for Ordering

## Regular Drills and Reamers

**Always order by Catalog Number and size**

## Special Drills and Reamers

**State kind of material being drilled or reamed and give the dimensions called for on the sketches on the opposite page:**

**A** Kind of flute—refer to catalog and give list number for general style of tool.

**B** Diameter of fluted section.

**C** Length overall.

**D** Length of flute.

**E** Diameter of fluted section at large end for taper reamer.

**F** Taper per foot for taper reamers.

**G** Diameter of shank for straight shank tools.

**H** Length of shank for straight shank tools.

**J** Size of square, if any.

**K** Length of square, if any.

**L** If Regular Taper Shank, give **Size Number.** For dimensions of Taper Shanks, see pages 6 and 189.

**M** Diameter and length of guide.

**N** Diameter and length of pilot.

If taper shank is special, give diameter at small end, length of shank, diameter at large end, taper per foot, and furnish a sample or gauge if possible. If tang is special, give thickness and length.

**Tolerances.** If special accuracy is required, please give tolerances on the important dimensions.

# Drilling Helps and Hints

IT IS our aim in these few pages to present to our friends a brief but comprehensive collection of ideas, based on our own practice and on observation in the use of twist drills, to assist in obtaining increased cutting capacity, maximum durability and satisfactory performance.

**Point Grinding** To get the maximum efficiency and full life of a properly made and tempered drill the first requisite is that it be properly ground at the point. This means that both cutting edges should have (a) the same inclination to the axis of the drill—(b) exactly the same length, as shown in Fig. 1, and (c) proper clearance.

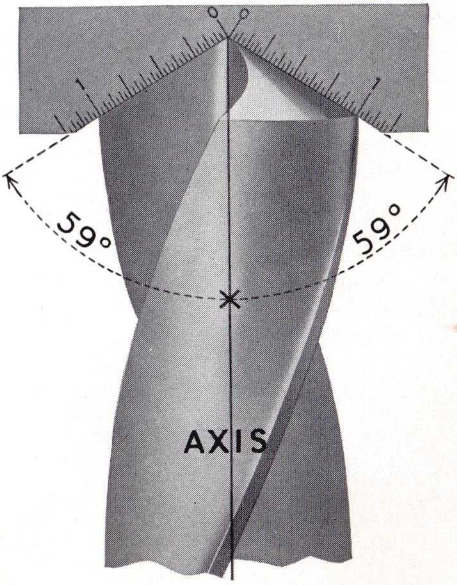


**Fig. 1—Correctly Ground Lips**

The two lips of this drill are of the same length and have the same angle to the axis of the drill.

**Angle of Lip Clearance** Our experience shows that 12° (see Fig. 2) is the best angle at the periphery of the drill. This angle should be increased gradually, as the center of the drill is approached and when the point is correctly ground the line across the center of the web stands at an angle of approximately 135°

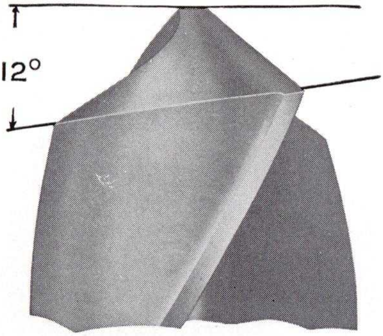


**Fig. 2**

Showing the proper way to grind the surface back of the cutting lip. The angle indicated is the angle *at the circumference of the drill.*

with the cutting edges as shown in Fig. 3. The failure to give sufficient angle of lip clearance at the center of the drill is the principal cause of splitting drills up the web.

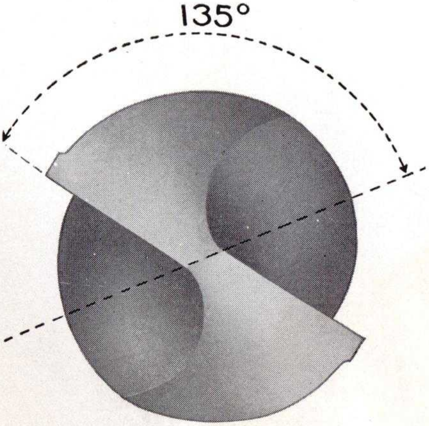


**Fig. 3**

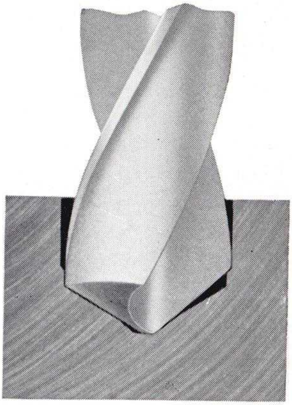


**Fig. 4—Incorrectly Ground Lips**
The angles of the two lips are different. As a result the cutting edge on your left is doing most of the work while the one on the right is removing only a small portion of metal. Note that the hole is *larger than the drill.*

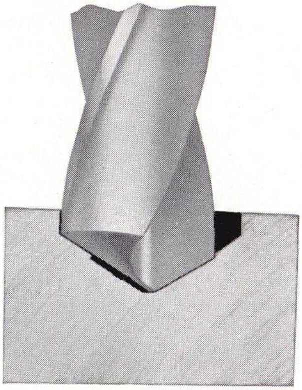


**Fig. 5—Incorrectly Ground Lips**
The *angles* of the lips are equal but their *lengths* are different. Here again the hole is much larger than the drill and the punishment to the tool is terrific.

## Cutting Edges Must be at Equal Angles and of Equal Length

When the point is central, but the angles of the cutting edges different, the drill will bind on the side of the hole opposite to the lip which is cutting. It will drill too large a hole, and all the work will fall on the one cutting edge. Fig. 4 illustrates this condition.

When the point is ground with equal angles but with cutting edges of different lengths, the point will no longer be central and the condition shown in Fig. 5 will result.

When both angle and length of cutting edges are wrong the drill will be laboring under the severe conditions shown in Fig. 6.

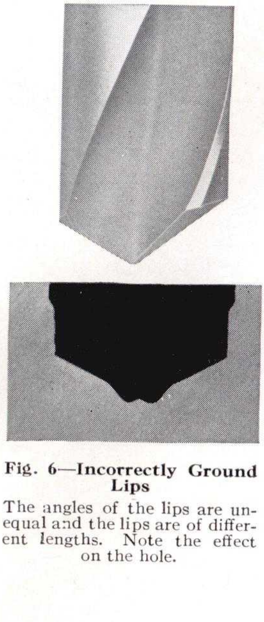


**Fig. 6—Incorrectly Ground Lips**
The angles of the lips are unequal and the lips are of different lengths. Note the effect on the hole.

# Drilling Speeds and Feeds

THE subject of the speed at which a drill should run and the feed per revolution is one upon which no hard and fast rule can be given. The composition and hardness of material, depth hole, lubricant, type machine used, condition of machine, set-up, point grinding, quality of holes desired, and many other items, have a distinct influence in the determination of the best and most economical speed and feed to use for any particular job. It should be remembered that the following speeds and feeds are merely suggestions and that it is possible to find many jobs that must be run under entirely different conditions. The correct speeds and feeds should be determined by good sound judgment and trial in each separate case.

## Suggested Speeds for High Speed Drills

| | Speed in F.P.M. |
|---|---|
| Mild Machinery Steel .2 to .3C | 80–110 |
| Steel .4 to .5C | 70– 80 |
| Tool Steel 1.2C | 50– 60 |
| Steel Forgings | 50– 60 |
| Alloy Steel | 50– 70 |
| Stainless Steel | 30– 40 |
| Soft Cast Iron | 100–150 |
| Hard Chilled Cast Iron | 70–100 |

| | Speed in F.P.M. |
|---|---|
| Malleable Iron | 80– 90 |
| Ordinary Brass & Bronze | 200–300 |
| High Tensile Bronze | 70–150 |
| Monel Metal | 40– 50 |
| Slate, Marble & Stone | 15– 25 |
| Aluminum & its alloys | 200–300 |
| Magnesium & its alloys | 250–400 |
| Bakelite | 100–150 |
| Wood | 300–400 |

Carbon drills should be run at speeds of from 40 to 50% of those given above.

## Feeds

Feeds are governed by the size of the drill and the material drilled. The general rule is to use a feed of .001 to .002 inch per revolution for drills smaller than ⅛ inch, .002 to .004 for drills ⅛ to ¼ inch, .004 to .007 for drills ¼ to ½ inch, .007 to .015 for drills ½ to 1 inch, and .015 to .025 for drills larger than 1 inch. Alloy and hard steels should generally be drilled at a lighter feed than given above while cast iron, brass and aluminum may usually be drilled with a heavier feed than given above.

**Indication of Extreme Speeds and Feeds** A drill split up the web is evidence of too much feed or insufficient lip clearance at the center due to improper grinding. The rapid wearing away of the extreme outer corners of the cutting edges indicates that the speed is too high. The best results will be obtained when the effect of the work on the tool is somewhere between the above conditions. A drill chipping or breaking out at the cutting edges indicates that either the feed is too heavy or the drill has been ground with too much lip clearance.

## Lubricants

**Cutting Compounds** To maintain the speeds and feeds recommended above it will be necessary to use some good cutting compound, and we recommend the following in the order named:

Hard and refractory steel—Turpentine, kerosene, soluble oil.
Soft steel and wrought iron—Lard oil, soluble oil.
Malleable iron—Soluble oil.
Brass—Dry.
Aluminum and soft alloys—Kerosene, soluble oil.
Cast iron—Dry or with a jet of compressed air for a cooling medium.

The above recommendations for lubricants apply equally well to Carbon or High Speed Drills.

**Speeds and Feeds Must be Adjusted To Hardness of the Material** A drill tempered to give maximum results drilling hard steel might be too brittle to work well in softer and tougher materials. The commercial twist drill is tempered for average conditions to give good results in either hard or soft material. Variations in the hardness of the material drilled should, of course, be met by the skilled operator with changes in the speed and feed.

**Importance of Speed in Drilling Small Holes** Insufficient speed in drilling small holes with hand feed greatly increases the risk of breakage, especially at the moment the point of the drill is breaking through the farther side of the work. This is due to the operator's inability to correctly gauge the feed when the drills are running too slow.

**Drilling with Automatic Machines** High speeds and light feeds are especially recommended for automatic machines where holes do not exceed four diameters of the drill in depth. For holes deeper than four diameters an oil hole or oil tube drill will often be found advantageous.

**Improper Cooling of High Speed Drills** Nothing will "check" a high speed drill quicker than to turn a stream of cold water on it after it has become heated working in a hole. It is equally bad to plunge it in cold water after the point has been heated in grinding. The small checks or cracks resulting from the above practice will eventually chip out and cause rapid wear or breakage.

**Breaking of Drills Often Due to Back Lash in Drilling Machine** Drills that are properly hardened and pointed and run at moderate speeds and feeds are often condemned on account of breakage when the trouble rightly should be charged to the drilling machine. If there is any spring or play between the upper part of the machine and the table, the drill will not begin to cut until the feed-pressure has taken this up, after which the feed will be practically constant until the point of the drill breaks through. As this happens, the resistance to the penetration of the drill is abruptly reduced and it "hogs in." This causes a great increase in torsional strain which frequently breaks the drill.

Any movement of the table with reference to the upper part of the machine while drilling a hole throws the spindle out of alignment with the hole and bends or cramps the drill which often causes it to break.

**The Function of a Tang** There seems to exist some misunderstanding regarding the function of the tang on a taper shank tool. The tang exists merely to assist the taper shank in driving the tool. It is not designed to withstand the entire driving strain.

Under ideal conditions no tang would be necessary, as a perfect fit between the taper shank and the hole in the spindle would, in itself, give a sufficient drive. When the parts are badly worn, or proper care has not been taken to keep the taper surfaces free from grit, the driving function of the taper fit is lost and an undue strain is thrown upon the tang. Under such conditions is it any wonder that occasionally the tang proves unequal to this additional burden and is twisted off?

If, however, the taper surfaces are kept clean and the driving parts in perfect condition, the tang will be required to perform only its legitimate function and the greater part of the trouble experienced from broken and twisted tangs will be eliminated.

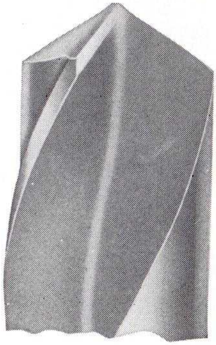


Fig. 7

Special grinding for hard material.

**Drilling in Hard Material** The drilling of hard material is facilitated by using turpentine as a cutting compound, and in the case of very hard material, by grinding off the sharp angles of the cutting edges, as shown in Fig. 7, so as to permit the use of heavy feeds without chipping the cutting edges. This must be done with extreme care and good judgment, however, or the drill will be unfitted for further use. This form of point will also be found efficient in drilling soft material, like brass, where the regular point has a tendency to "hog in" or "grab."

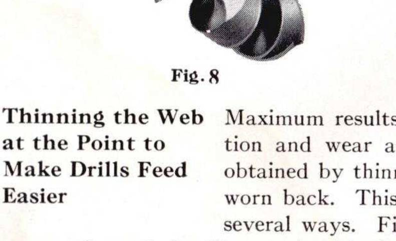


Fig. 8

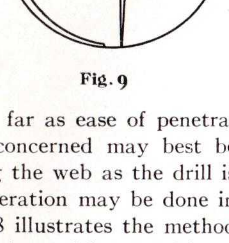


Fig. 9

**Thinning the Web at the Point to Make Drills Feed Easier** Maximum results as far as ease of penetration and wear are concerned may best be obtained by thinning the web as the drill is worn back. This operation may be done in several ways. Fig. 8 illustrates the method commonly used. In this case the thinning is done with a round faced emery wheel and the results obtained are shown in Fig. 9.

Fig. 10 and Fig. 11 illustrate what is known as the notched point thinning and is done with a sharp cornered hard emery wheel. This type of thinning is especially adapted for hand feed, such as crankshaft drilling, turret lathe, screw machine and similar work.

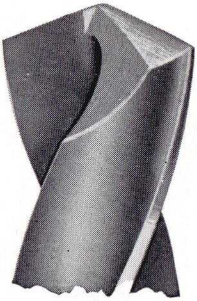


Fig. 10

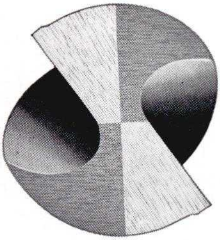
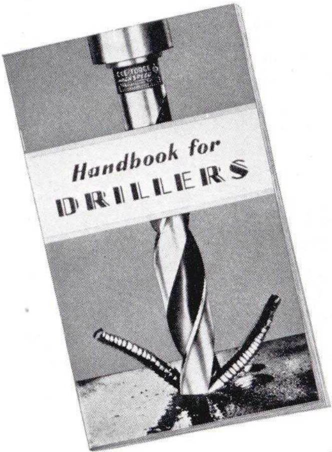


Fig. 11

**Filing not Reliable Test of Cutting Ability** A fact often lost sight of, even by experienced users of drills, is that cutting ability and hardness are not the same thing. This is especially true of high speed drills, the apparent hardness of which varies with the composition and heat treatment of the steel and is no indication of the cutting ability. Some of the best high speed tools we have ever tested could be filed very readily. A high speed drill that cannot be filed may, by exercising the greatest care, be made to drill extremely hard material successfully; but for softer materials, or where a large amount of work must be done in a minimum time, it will be found so brittle as to be unsatisfactory. Numerous tests have proven that the cutting ability of files varies quite as much as that of other hardened tools, and this is another reason why file tests are unreliable. No drill that files hard or soft should be condemned for that reason alone, but should first be given a drilling test in material of known hardness.

# SHOP HELPS


Handbook for
DRILLERS

## Handbook for Drillers

The Handbook for Drillers is the outstanding pamphlet on twist drills and drilling practice. It is widely used as a textbook in vocational schools throughout the United States. It explains the Point and Body of a Drill, Speeds and Feeds and gives numerous operative hints. Available in any reasonable quantities to instructors in vocational and apprentice schools, as well as to individuals.

## Ready Reference Charts

These cardboard charts —14 pages on 7 cards— contain a wealth of data for the practical shopman. Ready Reference contains Decimal Equivalents, Tables of Cutting Speeds, Information on Cutting Speeds, Feeds and Cutting Lubricants, Tap Drill Sizes —and a host of other data.

Ready reference is intended only for shops and requests should be made only on business letterheads. Students or teachers desiring it for school shops should write on school stationery.

Ready Reference
HANG ME UP IN THE SHOP
I WILL SAVE YOU TIME AND MISTAKES
Compliments of
The CLEVELAND
TWIST DRILL COMPANY

# The Little Doctor

## A First Aid
## For Drill Press Operators

| SYMPTOMS | PROBABLE CAUSE | REMEDY |
|---|---|---|
| BREAKING of drill. | Spring or back lash in press or work.<br>Too little lip clearance.<br>Too low speed in proportion to the feed.<br>Dull drill. | Test press and work for rigidity and alignment.<br>Regrind properly.<br>Increase speed or decrease feed.<br>Sharpen drill. |
| BREAKING down of outer corners of cutting edges. | Material being drilled has hard spots, scale or sand inclusions.<br>Too much speed.<br>Improper cutting compound.<br>No lubricant at point of drill. | Reduce speed.<br>Use proper cutting compound and correct application. |
| BREAKING of drill when drilling brass or wood. | Chips clog up flutes. | Increase speed.<br>Use drills designed for these materials. |
| BROKEN TANG. | Imperfect fit of taper shank in the socket—due to nicks, dirt, burrs or worn out socket. | Get a new socket or ream old one to prevent recurrence. |
| CHIPPING of margin. | Oversize jig bushing. | Use proper size bushing. |
| CHIPPING of lip or cutting edges. | Too much feed.<br>Too much lip clearance. | Reduce feed—see table on page 179. Regrind properly. |
| CHIPPING or checking of a high speed drill. | Heated and cooled too quickly while grinding or while drilling.<br>Too much feed. | Warm slowly before using.<br>Do not throw cold water on hot drill while grinding or drilling.<br>Reduce feed. |
| CHANGE in character of chips while drilling. | Change in condition of the drill such as chipping of cutting edge, dulling, etc. | Regrind drill properly. |
| HOLE too large. | Unequal angle or length of the cutting edges—or both. Loose spindle. | Regrind properly.<br>Test spindle for rigidity. |
| ONLY one lip cutting. | Unequal length or angle of cutting lips or both. | Regrind drill properly. |
| SPLITTING up center. | Too little lip clearance.<br>Too much feed. | Regrind with proper lip clearance.<br>Reduce feed. |
| ROUGH HOLE. | Dull or improperly ground drill. Lack of lubricant or wrong lubricant.<br>Improper set-up.<br>Too much feed. | Regrind properly.<br>Lubricate or change lubricant.<br>Reduce feed. |

# Table of Cutting Speeds

**(Fraction Size Drills)**

| Feet per Min. | 30′ | 40′ | 50′ | 60′ | 70′ | 80′ | 90′ | 100′ | 110′ | 120′ | 130′ | 140′ | 150′ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Diameter Inches | Revolutions per Minute | | | | | | | | | | | | |
| 1/16 | 1833 | 2445 | 3056 | 3667 | 4278 | 4889 | 5500 | 6111 | 6722 | 7334 | 7945 | 8556 | 9167 |
| 1/8 | 917 | 1222 | 1528 | 1833 | 2139 | 2445 | 2750 | 3056 | 3361 | 3667 | 3973 | 4278 | 4584 |
| 3/16 | 611 | 815 | 1019 | 1222 | 1426 | 1630 | 1833 | 2037 | 2241 | 2445 | 2648 | 2852 | 3056 |
| 1/4 | 458 | 611 | 764 | 917 | 1070 | 1222 | 1375 | 1528 | 1681 | 1833 | 1986 | 2139 | 2292 |
| 5/16 | 367 | 489 | 611 | 733 | 856 | 978 | 1100 | 1222 | 1345 | 1467 | 1589 | 1711 | 1833 |
| 3/8 | 306 | 407 | 509 | 611 | 713 | 815 | 917 | 1019 | 1120 | 1222 | 1324 | 1426 | 1528 |
| 7/16 | 262 | 349 | 437 | 524 | 611 | 698 | 786 | 873 | 960 | 1048 | 1135 | 1222 | 1310 |
| 1/2 | 229 | 306 | 382 | 458 | 535 | 611 | 688 | 764 | 840 | 917 | 993 | 1070 | 1146 |
| 5/8 | 183 | 244 | 306 | 367 | 428 | 489 | 550 | 611 | 672 | 733 | 794 | 856 | 917 |
| 3/4 | 153 | 203 | 255 | 306 | 357 | 407 | 458 | 509 | 560 | 611 | 662 | 713 | 764 |
| 7/8 | 131 | 175 | 218 | 262 | 306 | 349 | 393 | 436 | 480 | 524 | 568 | 611 | 655 |
| 1″ | 115 | 153 | 191 | 229 | 267 | 306 | 344 | 382 | 420 | 458 | 497 | 535 | 573 |
| 1 1/8 | 102 | 136 | 170 | 204 | 238 | 272 | 306 | 340 | 373 | 407 | 441 | 475 | 509 |
| 1 1/4 | 92 | 122 | 153 | 183 | 214 | 244 | 275 | 306 | 336 | 367 | 397 | 428 | 458 |
| 1 3/8 | 83 | 111 | 139 | 167 | 194 | 222 | 250 | 278 | 306 | 333 | 361 | 389 | 417 |
| 1 1/2 | 76 | 102 | 127 | 153 | 178 | 204 | 229 | 255 | 280 | 306 | 331 | 357 | 382 |
| 1 5/8 | 70 | 94 | 117 | 141 | 165 | 188 | 212 | 235 | 259 | 282 | 306 | 329 | 353 |
| 1 3/4 | 65 | 87 | 109 | 131 | 153 | 175 | 196 | 218 | 240 | 262 | 284 | 306 | 327 |
| 1 7/8 | 61 | 81 | 102 | 122 | 143 | 163 | 183 | 204 | 224 | 244 | 265 | 285 | 306 |
| 2″ | 57 | 76 | 95 | 115 | 134 | 153 | 172 | 191 | 210 | 229 | 248 | 267 | 287 |
| 2 1/4 | 51 | 68 | 85 | 102 | 119 | 136 | 153 | 170 | 187 | 204 | 221 | 238 | 255 |
| 2 1/2 | 46 | 61 | 76 | 92 | 107 | 122 | 137 | 153 | 168 | 183 | 199 | 214 | 229 |
| 2 3/4 | 42 | 56 | 69 | 83 | 97 | 111 | 125 | 139 | 153 | 167 | 181 | 194 | 208 |
| 3 | 38 | 51 | 64 | 76 | 89 | 102 | 115 | 127 | 140 | 153 | 166 | 178 | 191 |

*For Tap Drill Sizes—See Page 190*

# Table of Cutting Speeds

(Number Size Drills)

| Feet Per Min. | 30′ | 40′ | 50′ | 60′ | 70′ | 80′ | 90′ | 100′ | 110′ | 120′ | 130′ | 140′ | 150′ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. Size | Revolutions per Minute | | | | | | | | | | | | |
| 1 | 503 | 670 | 838 | 1005 | 1173 | 1340 | 1508 | 1675 | 1843 | 2010 | 2179 | 2346 | 2513 |
| 2 | 518 | 691 | 864 | 1037 | 1210 | 1382 | 1555 | 1728 | 1901 | 2074 | 2247 | 2420 | 2593 |
| 3 | 538 | 717 | 897 | 1076 | 1255 | 1434 | 1614 | 1793 | 1974 | 2152 | 2331 | 2511 | 2690 |
| 4 | 548 | 731 | 914 | 1097 | 1280 | 1462 | 1645 | 1828 | 2010 | 2193 | 2376 | 2560 | 2741 |
| 5 | 558 | 744 | 930 | 1115 | 1301 | 1487 | 1673 | 1859 | 2045 | 2230 | 2416 | 2602 | 2788 |
| 6 | 562 | 749 | 936 | 1123 | 1310 | 1498 | 1685 | 1872 | 2060 | 2247 | 2434 | 2621 | 2809 |
| 7 | 570 | 760 | 950 | 1140 | 1330 | 1520 | 1710 | 1900 | 2090 | 2281 | 2470 | 2660 | 2850 |
| 8 | 576 | 768 | 960 | 1151 | 1343 | 1535 | 1727 | 1919 | 2111 | 2303 | 2495 | 2687 | 2879 |
| 9 | 585 | 780 | 975 | 1169 | 1364 | 1559 | 1754 | 1949 | 2144 | 2339 | 2534 | 2728 | 2923 |
| 10 | 592 | 790 | 987 | 1184 | 1382 | 1579 | 1777 | 1974 | 2171 | 2369 | 2566 | 2764 | 2961 |
| 11 | 600 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3001 |
| 12 | 606 | 808 | 1010 | 1213 | 1415 | 1617 | 1819 | 2021 | 2223 | 2425 | 2627 | 2829 | 3032 |
| 13 | 620 | 826 | 1032 | 1239 | 1450 | 1652 | 1859 | 2065 | 2271 | 2479 | 2684 | 2891 | 3097 |
| 14 | 630 | 840 | 1050 | 1259 | 1469 | 1679 | 1889 | 2099 | 2309 | 2518 | 2728 | 2938 | 3148 |
| 15 | 638 | 851 | 1064 | 1276 | 1489 | 1702 | 1914 | 2127 | 2334 | 2546 | 2759 | 2971 | 3183 |
| 16 | 647 | 863 | 1079 | 1295 | 1511 | 1726 | 1942 | 2158 | 2374 | 2590 | 2806 | 3021 | 3237 |
| 17 | 662 | 883 | 1104 | 1325 | 1546 | 1766 | 1987 | 2208 | 2429 | 2650 | 2870 | 3091 | 3313 |
| 18 | 678 | 904 | 1130 | 1356 | 1582 | 1808 | 2034 | 2260 | 2479 | 2704 | 2930 | 3155 | 3380 |
| 19 | 690 | 920 | 1151 | 1381 | 1611 | 1841 | 2071 | 2301 | 2531 | 2761 | 2991 | 3222 | 3453 |
| 20 | 712 | 949 | 1186 | 1423 | 1660 | 1898 | 2135 | 2372 | 2610 | 2847 | 3084 | 3322 | 3559 |
| 21 | 721 | 961 | 1201 | 1441 | 1681 | 1922 | 2162 | 2402 | 2644 | 2883 | 3123 | 3363 | 3604 |
| 22 | 730 | 973 | 1217 | 1460 | 1703 | 1946 | 2190 | 2433 | 2676 | 2920 | 3164 | 3406 | 3649 |
| 23 | 744 | 992 | 1240 | 1488 | 1736 | 1984 | 2232 | 2480 | 2728 | 2976 | 3224 | 3472 | 3720 |
| 24 | 754 | 1005 | 1257 | 1508 | 1759 | 2010 | 2262 | 2513 | 2764 | 3016 | 3267 | 3518 | 3769 |
| 25 | 767 | 1022 | 1276 | 1533 | 1789 | 2044 | 2300 | 2555 | 2810 | 3066 | 3322 | 3577 | 3832 |
| 26 | 779 | 1039 | 1299 | 1559 | 1819 | 2078 | 2338 | 2598 | 2858 | 3118 | 3378 | 3638 | 3898 |
| 27 | 796 | 1061 | 1327 | 1592 | 1857 | 2122 | 2388 | 2653 | 2919 | 3183 | 3448 | 3714 | 3979 |
| 28 | 816 | 1088 | 1360 | 1631 | 1903 | 2175 | 2447 | 2719 | 2990 | 3262 | 3534 | 3806 | 4078 |
| 29 | 843 | 1124 | 1405 | 1685 | 1966 | 2247 | 2528 | 2809 | 3090 | 3370 | 3651 | 3932 | 4213 |
| 30 | 892 | 1189 | 1487 | 1784 | 2081 | 2378 | 2676 | 2973 | 3270 | 3567 | 3864 | 4162 | 4459 |
| 31 | 955 | 1273 | 1592 | 1910 | 2228 | 2546 | 2865 | 3183 | 3501 | 3821 | 4138 | 4456 | 4775 |
| 32 | 988 | 1317 | 1647 | 1976 | 2305 | 2634 | 2964 | 3293 | 3622 | 3951 | 4281 | 4610 | 4939 |
| 33 | 1014 | 1352 | 1690 | 2028 | 2366 | 2704 | 3042 | 3380 | 3718 | 4056 | 4394 | 4732 | 5070 |
| 34 | 1032 | 1376 | 1721 | 2065 | 2409 | 2753 | 3097 | 3442 | 3785 | 4129 | 4474 | 4818 | 5162 |
| 35 | 1042 | 1389 | 1736 | 2083 | 2430 | 2778 | 3125 | 3472 | 3821 | 4167 | 4514 | 4861 | 5209 |
| 36 | 1076 | 1435 | 1794 | 2152 | 2511 | 2870 | 3228 | 3587 | 3945 | 4304 | 4663 | 5021 | 5380 |
| 37 | 1102 | 1469 | 1837 | 2204 | 2571 | 2938 | 3306 | 3673 | 4040 | 4407 | 4775 | 5142 | 5509 |
| 38 | 1129 | 1505 | 1882 | 2258 | 2634 | 3010 | 3387 | 3763 | 4140 | 4516 | 4892 | 5269 | 5645 |
| 39 | 1152 | 1536 | 1920 | 2303 | 2687 | 3071 | 3455 | 3839 | 4222 | 4607 | 4991 | 5374 | 5758 |
| 40 | 1169 | 1559 | 1949 | 2339 | 2729 | 3118 | 3508 | 3898 | 4287 | 4677 | 5067 | 5457 | 5846 |
| 41 | 1194 | 1592 | 1990 | 2387 | 2785 | 3183 | 3581 | 3979 | 4377 | 4775 | 5172 | 5570 | 5968 |
| 42 | 1226 | 1634 | 2043 | 2451 | 2860 | 3268 | 3677 | 4085 | 4494 | 4902 | 5311 | 5719 | 6128 |
| 43 | 1288 | 1717 | 2146 | 2575 | 3004 | 3434 | 3863 | 4292 | 4721 | 5150 | 5579 | 6008 | 6438 |
| 44 | 1333 | 1777 | 2221 | 2665 | 3109 | 3554 | 3999 | 4442 | 4886 | 5330 | 5774 | 6218 | 6662 |
| 45 | 1397 | 1863 | 2329 | 2795 | 3261 | 3726 | 4192 | 4658 | 5124 | 5590 | 6056 | 6522 | 6987 |
| 46 | 1415 | 1886 | 2358 | 2830 | 3301 | 3773 | 4244 | 4716 | 5187 | 5659 | 6130 | 6602 | 7074 |
| 47 | 1460 | 1946 | 2433 | 2920 | 3406 | 3893 | 4379 | 4866 | 5352 | 5839 | 6326 | 6812 | 7299 |
| 48 | 1508 | 2010 | 2513 | 3016 | 3518 | 4021 | 4523 | 5026 | 5528 | 6031 | 6534 | 7036 | 7539 |
| 49 | 1570 | 2093 | 2617 | 3140 | 3663 | 4186 | 4710 | 5233 | 5756 | 6279 | 6808 | 7326 | 7849 |
| 50 | 1637 | 2183 | 2729 | 3274 | 3820 | 4366 | 4911 | 5457 | 6002 | 6548 | 7094 | 7640 | 8185 |
| 51 | 1710 | 2280 | 2851 | 3421 | 3991 | 4561 | 5131 | 5701 | 6271 | 6841 | 7413 | 7982 | 8552 |
| 52 | 1805 | 2406 | 3008 | 3609 | 4211 | 4812 | 5414 | 6015 | 6619 | 7218 | 7820 | 8421 | 9023 |
| 53 | 1924 | 2566 | 3207 | 3848 | 4490 | 5131 | 5773 | 6414 | 7062 | 7704 | 8346 | 8988 | 9630 |
| 54 | 2084 | 2778 | 3473 | 4167 | 4862 | 5556 | 6251 | 6945 | 7639 | 8334 | 9028 | 9723 | 10417 |
| 55 | 2204 | 2938 | 3673 | 4408 | 5142 | 5877 | 6611 | 7346 | 8080 | 8815 | 9549 | 10284 | 11028 |

*For Decimal Equivalents—See Page 194*

# Table of Cutting Speeds

(Number Size Drills)

| Feet Per Min. | 30′ | 40′ | 50′ | 60′ | 70′ | 80′ | 90′ | 100′ | 110′ | 120′ | 130′ | 140′ | 150′ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. Size | Revolutions per Minute | | | | | | | | | | | | |
| 56 | 2465 | 3286 | 4108 | 4929 | 5751 | 6572 | 7394 | 8215 | 9036 | 9857 | 10678 | 11500 | 12322 |
| 57 | 2671 | 3561 | 4452 | 5342 | 6232 | 7122 | 8013 | 8903 | 9771 | 10660 | 11548 | 12436 | 13325 |
| 58 | 2729 | 3637 | 4547 | 5456 | 6367 | 7275 | 8186 | 9095 | 10004 | 10913 | 11823 | 12732 | 13642 |
| 59 | 2795 | 3726 | 4658 | 5590 | 6521 | 7453 | 8388 | 9316 | 10248 | 11180 | 12111 | 13043 | 13975 |
| 60 | 2865 | 3820 | 4775 | 5729 | 6684 | 7639 | 8594 | 9549 | 10504 | 11459 | 12414 | 13369 | 14324 |
| 61 | 2938 | 3918 | 4897 | 5876 | 6856 | 7835 | 8815 | 9794 | 10774 | 11753 | 12732 | 13712 | 14691 |
| 62 | 3015 | 4020 | 5025 | 6030 | 7035 | 8040 | 9045 | 10050 | 11057 | 12060 | 13068 | 14073 | 15078 |
| 63 | 3096 | 4128 | 5160 | 6192 | 7224 | 8256 | 9288 | 10320 | 11366 | 12398 | 13421 | 14453 | 15485 |
| 64 | 3183 | 4244 | 5305 | 6366 | 7427 | 8488 | 9549 | 10610 | 11671 | 12732 | 13793 | 14854 | 15915 |
| 65 | 3273 | 4364 | 5455 | 6546 | 7637 | 8728 | 9819 | 10910 | 12005 | 13096 | 14187 | 15279 | 16370 |
| 66 | 3474 | 4632 | 5790 | 6948 | 8106 | 9264 | 10422 | 11580 | 12732 | 13890 | 15047 | 16205 | 17362 |
| 67 | 3582 | 4776 | 5970 | 7164 | 8358 | 9552 | 10746 | 11940 | 13130 | 14324 | 15517 | 16712 | 17905 |
| 68 | 3696 | 4928 | 6160 | 7392 | 8624 | 9856 | 11088 | 12320 | 13554 | 14786 | 16018 | 17250 | 18482 |
| 69 | 3918 | 5224 | 6530 | 7836 | 9142 | 10488 | 11754 | 13060 | 14389 | 15697 | 17006 | 18314 | 19622 |
| 70 | 4091 | 5456 | 6820 | 8184 | 9548 | 10912 | 12276 | 13640 | 15006 | 16370 | 17734 | 19099 | 20463 |
| 71 | 4419 | 5892 | 7365 | 8838 | 10311 | 11784 | 13257 | 14730 | 16160 | 17629 | 19099 | 20568 | 22037 |
| 72 | 4584 | 6112 | 7640 | 9168 | 10696 | 12224 | 13752 | 15280 | 16807 | 18335 | 19863 | 21390 | 22918 |
| 73 | 4776 | 6368 | 7960 | 9552 | 11144 | 12736 | 14328 | 15920 | 17507 | 19099 | 20690 | 22282 | 23873 |
| 74 | 5106 | 6808 | 8510 | 10212 | 11914 | 13616 | 15318 | 17020 | 18674 | 20372 | 22069 | 23767 | 25465 |
| 75 | 5457 | 7276 | 9095 | 10914 | 12733 | 14552 | 16371 | 18190 | 20008 | 21827 | 23646 | 25465 | 27284 |
| 76 | 5730 | 7640 | 9550 | 11460 | 13370 | 15280 | 17190 | 19100 | 21008 | 22918 | 24828 | 26738 | 28648 |
| 77 | 6366 | 8488 | 10610 | 12732 | 14854 | 16976 | 19098 | 21220 | 23343 | 25465 | 27587 | 29709 | 31831 |
| 78 | 7161 | 9548 | 11935 | 14322 | 16709 | 19096 | 21483 | 23870 | 26260 | 28648 | 31035 | 33422 | 35810 |
| 79 | 7902 | 10536 | 13170 | 15804 | 18438 | 21072 | 23706 | 26340 | 28988 | 31611 | 34246 | 36880 | 39514 |
| 80 | 8490 | 11320 | 14150 | 16980 | 19810 | 22640 | 25470 | 28300 | 31123 | 33953 | 36782 | 39612 | 42441 |

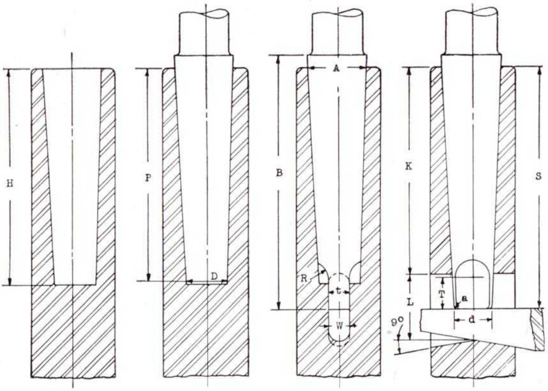
# Table of Cutting Speeds

(Letter Size Drills)

| Feet Per Min. | 30′ | 40′ | 50′ | 60′ | 70′ | 80′ | 90′ | 100′ | 110′ | 120′ | 130′ | 140′ | 150′ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size Letter | Revolutions per Minute | | | | | | | | | | | | |
| A | 491 | 654 | 818 | 982 | 1145 | 1309 | 1472 | 1636 | 1796 | 1959 | 2122 | 2285 | 2448 |
| B | 482 | 642 | 803 | 963 | 1124 | 1284 | 1445 | 1605 | 1765 | 1926 | 2086 | 2247 | 2407 |
| C | 473 | 631 | 789 | 947 | 1105 | 1262 | 1420 | 1578 | 1736 | 1894 | 2052 | 2210 | 2368 |
| D | 467 | 622 | 778 | 934 | 1089 | 1245 | 1400 | 1556 | 1708 | 1863 | 2018 | 2174 | 2329 |
| E | 458 | 611 | 764 | 917 | 1070 | 1222 | 1375 | 1528 | 1681 | 1834 | 1968 | 2139 | 2292 |
| F | 446 | 594 | 743 | 892 | 1040 | 1189 | 1337 | 1486 | 1635 | 1784 | 1932 | 2081 | 2229 |
| G | 440 | 585 | 732 | 878 | 1024 | 1170 | 1317 | 1463 | 1610 | 1756 | 1903 | 2049 | 2195 |
| H | 430 | 574 | 718 | 862 | 1005 | 1149 | 1292 | 1436 | 1580 | 1723 | 1867 | 2010 | 2154 |
| I | 421 | 562 | 702 | 842 | 983 | 1123 | 1264 | 1404 | 1545 | 1685 | 1826 | 1966 | 2106 |
| J | 414 | 552 | 690 | 827 | 965 | 1103 | 1241 | 1379 | 1517 | 1655 | 1793 | 1930 | 2068 |
| K | 408 | 544 | 680 | 815 | 951 | 1087 | 1223 | 1359 | 1495 | 1631 | 1767 | 1903 | 2039 |
| L | 395 | 527 | 659 | 790 | 922 | 1054 | 1185 | 1317 | 1449 | 1581 | 1712 | 1844 | 1976 |
| M | 389 | 518 | 648 | 777 | 907 | 1036 | 1166 | 1295 | 1424 | 1554 | 1683 | 1813 | 1942 |
| N | 380 | 506 | 633 | 759 | 886 | 1012 | 1139 | 1265 | 1391 | 1518 | 1644 | 1771 | 1897 |
| O | 363 | 484 | 605 | 725 | 846 | 967 | 1088 | 1209 | 1330 | 1450 | 1571 | 1692 | 1813 |
| P | 355 | 473 | 592 | 710 | 828 | 946 | 1065 | 1183 | 1301 | 1419 | 1537 | 1657 | 1774 |
| Q | 345 | 460 | 575 | 690 | 805 | 920 | 1035 | 1150 | 1266 | 1384 | 1496 | 1611 | 1726 |
| R | 338 | 451 | 564 | 676 | 789 | 902 | 1014 | 1127 | 1239 | 1355 | 1465 | 1577 | 1690 |
| S | 329 | 439 | 549 | 659 | 769 | 878 | 988 | 1098 | 1207 | 1317 | 1427 | 1537 | 1646 |
| T | 320 | 426 | 533 | 640 | 746 | 853 | 959 | 1066 | 1173 | 1280 | 1387 | 1494 | 1600 |
| U | 311 | 415 | 519 | 623 | 727 | 830 | 934 | 1038 | 1142 | 1246 | 1349 | 1453 | 1557 |
| V | 304 | 405 | 507 | 608 | 709 | 810 | 912 | 1013 | 1114 | 1219 | 1317 | 1418 | 1520 |
| W | 297 | 396 | 495 | 594 | 693 | 792 | 891 | 989 | 1088 | 1188 | 1286 | 1385 | 1484 |
| X | 289 | 385 | 481 | 576 | 672 | 769 | 865 | 962 | 1058 | 1155 | 1251 | 1347 | 1443 |
| Y | 284 | 378 | 473 | 567 | 662 | 756 | 851 | 945 | 1040 | 1135 | 1229 | 1324 | 1418 |
| Z | 277 | 370 | 462 | 555 | 647 | 740 | 832 | 925 | 1017 | 1110 | 1202 | 1295 | 1387 |

*For Decimal Equivalents—See Page 194*

# Cleveland Tapers



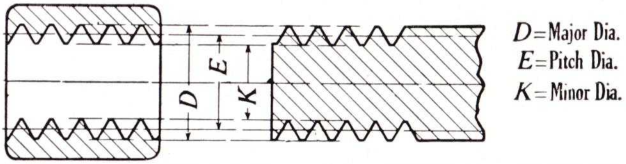
## Detail Dimensions

| Number of Taper | Dia. of Plug at Small End | Standard Plug Depth | Depth of Hole | End of Socket to Keyway | Length of Keyway | Width of Keyway | Length of Tongue | Dia. of Shank at Small End | Thickness of Tongue | Radius of Mill for Tongue | Radius of Tongue "a" | Shank Depth | Whole Length of Shank | Taper per Foot | Dia. at End of Socket | Taper per Inch | No. of Key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **D** | **P** | **H** | **K** | **L** | **W** | **T** | **d** | **t** | **R** | **a** | **S** | **B** | | **A** | | |
| 0 | .2518 | 2 | 2 1/32 | 1 15/16 | 9/16 | .160 | ¼ | .240 | 5/32 | 5/32 | .04 | 2 7/32 | 2 11/32 | .625 | .356 | .05208 | |
| 1 | .3688 | 2⅛ | 2 3/16 | 2 1/16 | ¾ | .213 | ⅜ | .353 | 13/64 | 3/16 | .05 | 2 7/16 | 2 9/16 | .600 | .475 | .05 | 1 |
| 2 | .5714 | 2 9/16 | 2⅝ | 2½ | ⅞ | .265 | 7/16 | .553 | ¼ | 9/32 | .06 | 2 15/16 | 3⅛ | .602 | .700 | .05017 | 2 |
| 3 | .7781 | 3 3/16 | 3¼ | 3 1/16 | 1 1/16 | .330 | 9/16 | .753 | 5/16 | 9/32 | .08 | 3 11/16 | 3⅞ | .602 | .938 | .05017 | 3 |
| 4 | 1.0201 | 4 1/16 | 4⅛ | 3⅞ | 1¼ | .490 | ⅝ | .991 | 15/32 | 7/16 | .10 | 4⅝ | 4⅞ | .623 | 1.231 | .05191 | 4 |
| 5 | 1.4757 | 5 3/16 | 5¼ | 4 15/16 | 1½ | .650 | ¾ | 1.440 | ⅝ | ½ | .12 | 5⅞ | 6⅛ | .630 | 1.748 | .0525 | 4 |
| 6 | 2.1158 | 7¼ | 7⅜ | 7 | 1¾ | .780 | 1 | 2.064 | ¾ | 11/16 | .15 | 8¼ | 8 9/16 | .626 | 2.494 | .05216 | 4 |
| 7 | 2.7492 | 10 | 10⅛ | 9½ | 2⅝ | 1.135 | 1⅜ | 2.684 | 1⅛ | ¾ | .18 | 11¼ | 11⅝ | .625 | 3.270 | .05208 | |

# Basic Thread Dimensions and Tap Drill Sizes

## American National Coarse Thread

**Formerly A. S. M. E. Regular for Sizes 1-12;**
**U. S. Standard for Sizes ¼ in. and larger**



| Size of Thread and Threads per Inch | Major Diameter D Inches | Pitch Diameter E Inches | Minor Diameter K Inches | Commercial Tap Drill to Produce Approx. 75% Full Thread | Decimal Equivalent of Tap Drill Inches |
|---|---|---|---|---|---|
| 1 x64 | .0730 | .0629 | .0527 | No. 53 | .0595 |
| 2 x56 | .0860 | .0744 | .0628 | No. 50 | .0700 |
| 3 x48 | .0990 | .0855 | .0719 | No. 47 | .0785 |
| 4 x40 | .1120 | .0958 | .0795 | No. 43 | .0890 |
| 5 x40 | .1250 | .1088 | .0925 | No. 38 | .1015 |
| 6 x32 | .1380 | .1177 | .0974 | No. 36 | .1065 |
| 8 x32 | .1640 | .1437 | .1234 | No. 29 | .1360 |
| 10 x24 | .1900 | .1629 | .1359 | No. 25 | .1495 |
| 12 x24 | .2160 | .1889 | .1619 | No. 16 | .1770 |
| ¼x20 | .2500 | .2175 | .1850 | No. 7 | .2010 |
| 5/16x18 | .3125 | .2764 | .2403 | F | .2570 |
| ⅜x16 | .3750 | .3344 | .2938 | 5/16 | .3125 |
| 7/16x14 | .4375 | .3911 | .3447 | U | .3680 |
| ½x13 | .5000 | .4500 | .4001 | 27/64 | .4219 |
| 9/16x12 | .5625 | .5084 | .4542 | 31/64 | .4844 |
| ⅝x11 | .6250 | .5660 | .5069 | 17/32 | .5312 |
| ¾x10 | .7500 | .6850 | 6201 | 21/32 | .6562 |
| ⅞x 9 | .8750 | .8028 | .7307 | 49/64 | .7656 |
| 1 x 8 | 1.0000 | .9188 | .8376 | ⅞ | .8750 |
| 1⅛x 7 | 1.1250 | 1.0322 | .9394 | 63/64 | .9844 |
| 1¼x 7 | 1.2500 | 1.1572 | 1.0644 | 1 7/64 | 1.1094 |
| 1⅜x 6 | 1.3750 | 1.2667 | 1.1585 | 1 7/32 | 1.2187 |
| 1½x 6 | 1.5000 | 1.3917 | 1.2835 | 1 21/64 | 1.3281 |
| 1¾x 5 | 1.7500 | 1.6201 | 1.4902 | 1 35/64 | 1.5469 |
| 2 x 4½ | 2.0000 | 1.8557 | 1.7113 | 1 25/32 | 1.7812 |
| 2¼x 4½ | 2.2500 | 2.1057 | 1.9613 | 2 1/32 | 2.0312 |
| 2½x 4 | 2.5000 | 2.3376 | 2.1752 | 2¼ | 2.2500 |
| 2¾x 4 | 2.7500 | 2.5876 | 2.4252 | 2½ | 2.5000 |
| 3 x 4 | 3.0000 | 2.8376 | 2.6752 | 2¾ | 2.7500 |
| 3¼x 4 | 3.2500 | 3.0876 | 2.9252 | 3 | 3.0000 |
| 3½x 4 | 3.5000 | 3.3376 | 3.1752 | 3¼ | 3.2500 |
| 3¾x 4 | 3.7500 | 3.5876 | 3.4252 | 3½ | 3.5000 |
| 4 x 4 | 4.0000 | 3.8376 | 3.6752 | 3¾ | 3.7500 |

# Basic Thread Dimensions and Tap Drill Sizes

## AMERICAN NATIONAL FORM THREAD
## SPECIAL PITCHES

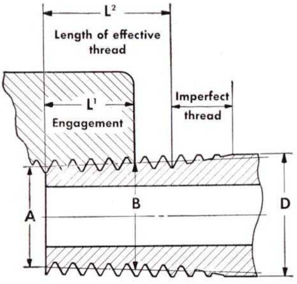
| Size of Thread and Threads per Inch | Major Diameter D Inches | Pitch Diameter E Inches | Minor Diameter K Inches | Commercial Tap Drill to Produce Approx. 75 % Full Thread | Decimal Equivalent of Tap Drill Inches |
|---|---|---|---|---|---|
| 1/4x24 | .2500 | .2229 | .1959 | 4 | .2090 |
| 5/16x20 | .3125 | .2800 | .2475 | 17/64 | .2656 |
| 3/8x20 | .3750 | .3425 | .3100 | 21/64 | .3281 |
| 7/16x24 | .4375 | .4104 | .3834 | X | .3970 |
| 1/2x12 | .5000 | .4459 | .3917 | 27/64 | .4219 |
| 1/2x16 | .5000 | .4594 | .4188 | 7/16 | .4375 |
| 1/2x24 | .5000 | .4729 | .4459 | 29/64 | .4531 |
| 9/16x16 | .5625 | .5219 | .4813 | 1/2 | .5000 |
| 5/8x12 | .6250 | .5709 | .5167 | 35/64 | .5469 |
| 5/8x16 | .6250 | .5844 | .5438 | 9/16 | .5625 |
| 11/16x11 | .6875 | .6285 | .5694 | 19/32 | .5937 |
| 11/16x12 | .6875 | .6334 | .5792 | 39/64 | .6094 |
| 11/16x16 | .6875 | .6469 | .6063 | 5/8 | .6250 |
| 3/4x12 | .7500 | .6959 | .6417 | 43/64 | .6719 |
| 13/16x10 | .8125 | .7476 | .6826 | 23/32 | .7187 |
| 13/16x12 | .8125 | .7584 | .7042 | 47/64 | .7344 |
| 13/16x16 | .8125 | .7719 | .7313 | 3/4 | .7500 |
| 7/8x12 | .8750 | .8209 | .7667 | 51/64 | .7969 |
| 7/8x16 | .8750 | .8344 | .7938 | 13/16 | .8125 |
| 15/16x 9 | .9375 | .8653 | .7932 | 53/64 | .8281 |
| 15/16x12 | .9375 | .8834 | .8292 | 55/64 | .8594 |
| 15/16x16 | .9375 | .8969 | .8563 | 7/8 | .8750 |
| 1 x12 | 1.0000 | .9459 | .8917 | 59/64 | .9219 |
| 1 x16 | 1.0000 | .9594 | .9188 | 15/16 | .9375 |
| 1 1/8x16 | 1.1250 | 1.0844 | 1.0438 | 1 1/16 | 1.0625 |
| 1 1/4x16 | 1.2500 | 1.2094 | 1.1688 | 1 3/16 | 1.1875 |
| 1 3/8x16 | 1.3750 | 1.3344 | 1.2938 | 1 5/16 | 1.3125 |
| 1 1/2x16 | 1.5000 | 1.4594 | 1.4188 | 1 7/16 | 1.4375 |
| 1 5/8x 5 1/2 | 1.6250 | 1.5069 | 1.3888 | 1 29/64 | 1.4531 |
| 1 3/4x10 | 1.7500 | 1.6850 | 1.6201 | 1 21/32 | 1.6562 |
| 1 3/4x12 | 1.7500 | 1.6959 | 1.6417 | 1 43/64 | 1.6719 |
| 1 3/4x16 | 1.7500 | 1.7094 | 1.6688 | 1 11/16 | 1.6875 |
| 1 7/8x 5 | 1.8750 | 1.7451 | 1.6152 | 1 11/16 | 1.6875 |
| 2 x10 | 2.0000 | 1.9350 | 1.8701 | 1 29/32 | 1.9062 |
| 2 x12 | 2.0000 | 1.9459 | 1.8917 | 1 59/64 | 1.9219 |
| 2 x16 | 2.0000 | 1.9594 | 1.9188 | 1 15/16 | 1.9375 |
| 2 1/8x 4 1/2 | 2.1250 | 1.9807 | 1.8363 | 1 29/32 | 1.9062 |
| 2 1/4x 8 | 2.2500 | 2.1688 | 2.0876 | 2 1/8 | 2.1250 |
| 2 1/4x12 | 2.2500 | 2.1959 | 2.1417 | 2 11/64 | 2.1719 |
| 2 1/4x16 | 2.2500 | 2.2094 | 2.1688 | 2 3/16 | 2.1875 |
| 2 3/8x 4 | 2.3750 | 2.2126 | 2.0502 | 2 1/8 | 2.1250 |
| 2 1/2x 8 | 2.5000 | 2.4188 | 2.3376 | 2 3/8 | 2.3750 |
| 2 1/2x12 | 2.5000 | 2.4459 | 2.3917 | 2 27/64 | 2.4219 |
| 2 1/2x16 | 2.5000 | 2.4594 | 2.4188 | 2 7/16 | 2.4375 |
| 2 3/4x 8 | 2.7500 | 2.6688 | 2.5876 | 2 5/8 | 2.6250 |
| 2 3/4x12 | 2.7500 | 2.6959 | 2.6417 | 2 43/64 | 2.6719 |
| 2 3/4x16 | 2.7500 | 2.7094 | 2.6688 | 2 11/16 | 2.6875 |
| 3 x 3 1/2 | 3.0000 | 2.8144 | 2.6288 | 2 23/32 | 2.7187 |
| 3 x 8 | 3.0000 | 2.9188 | 2.8376 | 2 7/8 | 2.8750 |
| 3 x12 | 3.0000 | 2.9459 | 2.8917 | 2 59/64 | 2.9219 |
| 3 x16 | 3.0000 | 2.9594 | 2.9188 | 2 15/16 | 2.9375 |

# Basic Thread Dimensions and Tap Drill Sizes

## American National Fine Threads

**Formerly A. S. M. E. Special for Sizes 0-12;**
**S. A. E. Standard for Sizes $\frac{1}{4}$ in. and larger**

| Size of Thread and Threads per Inch | Major Diameter D Inches | Pitch Diameter E Inches | Minor Diameter K Inches | Commercial Tap Drill to Produce Approx. 75% Full Thread | Decimal Equivalent of Tap Drill Inches |
|---|---|---|---|---|---|
| 0 x80 | .0600 | .0519 | .0438 | $\frac{3}{64}$ | .0469 |
| 1 x72 | .0730 | .0640 | .0550 | No. 53 | .0595 |
| 2 x64 | .0860 | .0759 | .0657 | No. 50 | .0700 |
| 3 x56 | .0990 | .0874 | .0758 | No. 45 | .0820 |
| 4 x48 | .1120 | .0985 | .0849 | No. 42 | .0935 |
| 5 x44 | .1250 | .1102 | .0955 | No. 37 | .1040 |
| 6 x40 | .1380 | .1218 | .1055 | No. 33 | .1130 |
| 8 x36 | .1640 | .1460 | .1279 | No. 29 | .1360 |
| 10 x32 | .1900 | .1697 | .1494 | No. 21 | .1590 |
| 12 x28 | .2160 | .1928 | .1696 | No. 14 | .1820 |
| $\frac{1}{4}$x28 | .2500 | .2268 | .2036 | No. 3 | .2130 |
| $\frac{5}{16}$x24 | .3125 | .2854 | .2584 | I | .2720 |
| $\frac{3}{8}$x24 | .3750 | .3479 | .3209 | Q | .3320 |
| $\frac{7}{16}$x20 | .4375 | .4050 | .3725 | $\frac{25}{64}$ | .3906 |
| $\frac{1}{2}$x20 | .5000 | .4675 | .4350 | $\frac{29}{64}$ | .4531 |
| $\frac{9}{16}$x18 | .5625 | .5264 | .4903 | $\frac{33}{64}$ | .5156 |
| $\frac{5}{8}$x18 | .6250 | .5889 | .5528 | $\frac{37}{64}$ | .5781 |
| $\frac{3}{4}$x16 | .7500 | .7094 | .6688 | $\frac{11}{16}$ | .6875 |
| $\frac{7}{8}$x14 | .8750 | .8286 | .7822 | $\frac{13}{16}$ | .8125 |
| 1 x14 | 1.0000 | .9536 | .9072 | $\frac{15}{16}$ | .9375 |
| $1\frac{1}{8}$x12 | 1.1250 | 1.0709 | 1.0167 | $1\frac{3}{64}$ | 1.0469 |
| $1\frac{1}{4}$x12 | 1.2500 | 1.1959 | 1.1417 | $1\frac{11}{64}$ | 1.1719 |
| $1\frac{3}{8}$x12 | 1.3750 | 1.3209 | 1.2667 | $1\frac{19}{64}$ | 1.2969 |
| $1\frac{1}{2}$x12 | 1.5000 | 1.4459 | 1.3917 | $1\frac{27}{64}$ | 1.4219 |



**Taper ¾″ per foot on diameter**

# American National Pipe Thread

**A** Pitch Diameter of thread at end of pipe

**B** Pitch Diameter of thread at gauging notch

**D** Outside Diameter of pipe

**L1** Normal engagement by hand between external and internal thread.

| Nominal Size Inches | No. of Threads per Inch | Pitch Diameter | | Length | | Pipe O. D. D Inches | Depth of Thread Inches | Tap Drills for Pipe Threads | |
|---|---|---|---|---|---|---|---|---|---|
| | | A Inches | B Inches | L2 Inches | L1 Inches | | | Minor Diameter Small End of Pipe | Size Drill |
| ⅛ | 27 | .36351 | .37476 | .2638 | .180 | .405 | .02963 | .33388 | R |
| ¼ | 18 | .47739 | .48989 | .4018 | .200 | .540 | .04444 | .43294 | 7/16 |
| ⅜ | 18 | .61201 | .62701 | .4078 | .240 | .675 | .04444 | .56757 | 37/64 |
| ½ | 14 | .75843 | .77843 | .5337 | .320 | .840 | .05714 | .70129 | 23/32 |
| ¾ | 14 | .96768 | .98887 | .5457 | .339 | 1.050 | .05714 | .91054 | 59/64 |
| 1 | 11½ | 1.21363 | 1.23863 | .6828 | .400 | 1.315 | .06957 | 1.14407 | 1 5/32 |
| 1¼ | 11½ | 1.55713 | 1.58338 | .7068 | .420 | 1.660 | .06957 | 1.48757 | 1½ |
| 1½ | 11½ | 1.79609 | 1.82234 | .7235 | .420 | 1.900 | .06957 | 1.72652 | 1 47/64 |
| 2 | 11½ | 2.26902 | 2.29627 | .7565 | .436 | 2.375 | .06957 | 2.19946 | 2 7/32 |
| 2½ | 8 | 2.71953 | 2.76216 | 1.1375 | .682 | 2.875 | .10000 | 2.61953 | 2⅝ |
| 3 | 8 | 3.34062 | 3.38850 | 1.2000 | .766 | 3.500 | .10000 | 3.24063 | 3¼ |
| 3½ | 8 | 3.83750 | 3.88881 | 1.2500 | .821 | 4.000 | .10000 | 3.73750 | 3¾ |
| 4 | 8 | 4.33438 | 4.38712 | 1.3000 | .844 | 4.500 | .10000 | 4.23438 | 4¼ |

## Decimal Equivalents of Regular Sizes

| Decimal | Inch | Wire | m/m | Decimal | Inch | Wire | m/m | Decimal | Inch | Wire | m/m |
|---|---|---|---|---|---|---|---|---|---|---|---|
| .0135 | | 80 | | .0312 | $\frac{1}{32}$ | | | .0472 | | | 1.2 |
| .0145 | | 79 | | .0315 | | | .8 | .0492 | | | 1.25 |
| .0156 | $\frac{1}{64}$ | | | .0320 | | 67 | | .0512 | | | 1.3 |
| .0160 | | 78 | | .0330 | | 66 | | .0520 | | 55 | |
| .0180 | | 77 | | .0350 | | 65 | | .0550 | | 54 | |
| .0197 | | | .5 | .0354 | | | .9 | .0551 | | | 1.4 |
| .0200 | | 76 | | .0360 | | 64 | | .0591 | | | 1.5 |
| .0210 | | 75 | | .0370 | | 63 | | .0595 | | 53 | |
| .0225 | | 74 | | .0380 | | 62 | | .0625 | $\frac{1}{16}$ | | |
| .0236 | | | .6 | .0390 | | 61 | | .0629 | | | 1.6 |
| .0240 | | 73 | | .0394 | | | 1. | .0635 | | 52 | |
| .0250 | | 72 | | .0400 | | 60 | | .0669 | | | 1.7 |
| 0260 | | 71 | | .0410 | | 59 | | .0670 | | 51 | |
| .0276 | | | .7 | .0420 | | 58 | | .0689 | | | 1.75 |
| .0280 | | 70 | | .0430 | | 57 | | .0700 | | 50 | |
| .0292 | | 69 | | .0433 | | | 1.1 | .0709 | | | 1.8 |
| .0295 | | | .75 | .0465 | | 56 | | .0730 | | 49 | |
| .0310 | | 68 | | .0469 | $\frac{3}{64}$ | | | .0748 | | | 1.9 |

# Decimal Equivalents of Regular Sizes

| Decimal | Inch | Wire | m/m | Decimal | Inch | Wire | m/m | Decimal | Inch | Wire | m/m |
|---|---|---|---|---|---|---|---|---|---|---|---|
| .0760 | | 48 | | .1250 | 1/8 | | | .1771 | | | 4.5 |
| .0781 | 5/64 | | | .1260 | | | 3.2 | .1800 | | 15 | |
| .0785 | | 47 | | .1280 | | | 3.25 | .1811 | | | 4.6 |
| .0787 | | | 2. | .1285 | | 30 | | .1820 | | 14 | |
| .0810 | | 46 | | .1299 | | | 3.3 | .1850 | | 13 | 4.7 |
| .0820 | | 45 | | .1339 | | | 3.4 | .1870 | | | 4.75 |
| .0827 | | | 2.1 | .1360 | | 29 | | .1875 | 3/16 | | |
| .0860 | | 44 | | .1378 | | | 3.5 | .1890 | | 12 | 4.8 |
| .0866 | | | 2.2 | .1405 | | 28 | | .1910 | | 11 | |
| .0886 | | | 2.25 | .1406 | 9/64 | | | .1929 | | | 4.9 |
| .0890 | | 43 | | .1417 | | | 3.6 | .1935 | | 10 | |
| .0905 | | | 2.3 | .1440 | | 27 | | .1960 | | 9 | |
| .0935 | | 42 | | .1457 | | | 3.7 | .1968 | | | 5. |
| .0937 | 3/32 | | | .1470 | | 26 | | .1990 | | 8 | |
| .0945 | | | 2.4 | .1477 | | | 3.75 | .2008 | | | 5.1 |
| .0960 | | 41 | | .1495 | | 25 | | .2010 | | 7 | |
| .0980 | | 40 | | .1496 | | | 3.8 | .2031 | 13/64 | | |
| .0984 | | | 2.5 | .1520 | | 24 | | .2040 | | 6 | |
| .0995 | | 39 | | .1535 | | | 3.9 | .2047 | | | 5.2 |
| .1015 | | 38 | | .1540 | | 23 | | .2055 | | 5 | |
| .1024 | | | 2.6 | .1562 | 5/32 | | | .2067 | | | 5.25 |
| .1040 | | 37 | | .1570 | | 22 | | .2087 | | | 5.3 |
| .1063 | | | 2.7 | .1575 | | | 4. | .2090 | | 4 | |
| .1065 | | 36 | | .1590 | | 21 | | .2126 | | | 5.4 |
| .1083 | | | 2.75 | .1610 | | 20 | | .2130 | | 3 | |
| .1094 | 7/64 | | | .1614 | | | 4.1 | .2165 | | | 5.5 |
| .1100 | | 35 | | .1654 | | | 4.2 | .2187 | 7/32 | | |
| .1102 | | | 2.8 | .1660 | | 19 | | .2205 | | | 5.6 |
| .1110 | | 34 | | .1674 | | | 4.25 | .2210 | | 2 | |
| .1130 | | 33 | | .1693 | | | 4.3 | .2244 | | | 5.7 |
| .1142 | | | 2.9 | .1695 | | 18 | | .2264 | | | 5.75 |
| .1160 | | 32 | | .1719 | 11/64 | | | .2280 | | 1 | |
| .1181 | | | 3. | .1730 | | 17 | | .2283 | | | 5.8 |
| .1200 | | 31 | | .1732 | | | 4.4 | .2323 | | | 5.9 |
| .1220 | | | 3.1 | .1770 | | 16 | | | | | |

# Decimal Equivalents of Regular Sizes

| Decimal | Inch | Letter | m/m | Decimal | Inch | Letter | m/m | Decimal | Inch | m/m |
|---|---|---|---|---|---|---|---|---|---|---|
| .2340 | | A | | .3320 | | Q | | .5625 | 9/16 | |
| .2344 | 15/64 | | | .3346 | | | 8.5 | .5709 | | 14.5 |
| .2362 | | | 6. | .3386 | | | 8.6 | .5781 | 37/64 | |
| .2380 | | B | | .3390 | | R | | .5906 | | 15. |
| .2401 | | | 6.1 | .3425 | | | 8.7 | .5937 | 19/32 | |
| .2420 | | C | | .3437 | 11/32 | | | .6094 | 39/64 | |
| .2441 | | | 6.2 | .3445 | | | 8.75 | .6102 | | 15.5 |
| .2460 | | D | | .3465 | | | 8.8 | .6250 | ⅝ | |
| .2461 | | | 6.25 | .3480 | | S | | .6299 | | 16. |
| .2480 | | | 6.3 | .3504 | | | 8.9 | .6406 | 41/64 | |
| .2500 | ¼ | E | | .3543 | | | 9. | .6496 | | 16.5 |
| .2520 | | | 6.4 | .3580 | | T | | .6562 | 21/32 | |
| .2559 | | | 6.5 | .3583 | | | 9.1 | .6693 | | 17. |
| .2570 | | F | | .3594 | 23/64 | | | .6719 | 43/64 | |
| .2598 | | | 6.6 | .3622 | | | 9.2 | .6875 | 11/16 | |
| .2610 | | G | | .3642 | | | 9.25 | .6890 | | 17.5 |
| .2638 | | | 6.7 | .3661 | | | 9.3 | .7031 | 45/64 | |
| .2656 | 17/64 | | | .3680 | | U | | .7087 | | 18. |
| .2658 | | | 6.75 | .3701 | | | 9.4 | .7187 | 23/32 | |
| .2660 | | H | | .3740 | | | 9.5 | .7283 | | 18.5 |
| .2677 | | | 6.8 | .3750 | ⅜ | | | .7344 | 47/64 | |
| .2716 | | | 6.9 | .3770 | | V | | .7480 | | 19. |
| .2720 | | I | | .3780 | | | 9.6 | .7500 | ¾ | |
| .2756 | | | 7. | .3819 | | | 9.7 | .7656 | 49/64 | |
| .2770 | | J | | .3839 | | | 9.75 | .7677 | | 19.5 |
| .2795 | | | 7.1 | .3858 | | | 9.8 | .7812 | 25/32 | |
| .2810 | | K | | .3860 | | W | | .7874 | | 20. |
| .2812 | 9/32 | | | .3898 | | | 9.9 | .7969 | 51/64 | |
| .2835 | | | 7.2 | .3906 | 25/64 | | | .8071 | | 20.5 |
| .2855 | | | 7.25 | .3937 | | | 10. | .8125 | 13/16 | |
| .2874 | | | 7.3 | .3970 | | X | | .8268 | | 21. |
| .2900 | | L | | .4040 | | Y | | .8281 | 53/64 | |
| .2913 | | | 7.4 | .4062 | 13/32 | | | .8437 | 27/32 | |
| .2950 | | M | | .4130 | | Z | | .8465 | | 21.5 |
| .2953 | | | 7.5 | .4134 | | | 10.5 | .8594 | 55/64 | |
| .2969 | 19/64 | | | .4219 | 27/64 | | | .8661 | | 22. |
| .2992 | | | 7.6 | .4330 | | | 11. | .8750 | ⅞ | |
| .3020 | | N | | .4375 | 7/16 | | | .8858 | | 22.5 |
| .3031 | | | 7.7 | .4528 | | | 11.5 | .8906 | 57/64 | |
| .3051 | | | 7.75 | .4531 | 29/64 | | | .9055 | | 23. |
| .3071 | | | 7.8 | .4687 | 15/32 | | | .9062 | 29/32 | |
| .3110 | | | 7.9 | .4724 | | | 12. | .9219 | 59/64 | |
| .3125 | 5/16 | | | .4844 | 31/64 | | | .9252 | | 23.5 |
| .3150 | | | 8. | .4921 | | | 12.5 | .9375 | 15/16 | |
| .3160 | | O | | .5000 | ½ | | | .9449 | | 24. |
| .3189 | | | 8.1 | .5118 | | | 13. | .9531 | 61/64 | |
| .3228 | | | 8.2 | .5156 | 33/64 | | | .9646 | | 24.5 |
| .3230 | | P | | .5312 | 17/32 | | | .9687 | 31/32 | |
| .3248 | | | 8.25 | .5315 | | | 13.5 | .9843 | | 25. |
| .3268 | | | 8.3 | .5469 | 35/64 | | | .9844 | 63/64 | |
| .3281 | 21/64 | | | .5512 | | | 14. | 1.0000 | 1″ | |
| .3307 | | | 8.4 | | | | | | | |

# Decimal Equivalents of Regular Sizes

| Decimal | Inch | m/m | Decimal | Inch | m/m | Decimal | Inch | m/m |
|---|---|---|---|---|---|---|---|---|
| 1.0040 | | 25.5 | 1.4370 | | 36.5 | 1.8594 | $1\frac{55}{64}$ | |
| 1.0156 | $1\frac{1}{64}$ | | 1.4375 | $1\frac{7}{16}$ | | 1.8701 | | 47.5 |
| 1.0236 | | 26. | 1.4531 | $1\frac{29}{64}$ | | 1.8750 | 1⅞ | |
| 1.0312 | $1\frac{1}{32}$ | | 1.4567 | | 37. | 1.8898 | | 48. |
| 1.0433 | | 26.5 | 1.4687 | $1\frac{15}{32}$ | | 1.8906 | $1\frac{57}{64}$ | |
| 1.0469 | $1\frac{3}{64}$ | | 1.4764 | | 37.5 | 1.9062 | $1\frac{29}{32}$ | |
| 1.0625 | $1\frac{1}{16}$ | | 1.4844 | $1\frac{31}{64}$ | | 1.9095 | | 48.5 |
| 1.0630 | | 27. | 1.4961 | | 38. | 1.9219 | $1\frac{59}{64}$ | |
| 1.0781 | $1\frac{5}{64}$ | | 1.5000 | 1½ | | 1.9291 | | 49. |
| 1.0827 | | 27.5 | 1.5156 | $1\frac{33}{64}$ | | 1.9375 | $1\frac{15}{16}$ | |
| 1.0937 | $1\frac{3}{32}$ | | 1.5158 | | 38.5 | 1.9488 | | 49.5 |
| 1.1024 | | 28. | 1.5312 | $1\frac{17}{32}$ | | 1.9531 | $1\frac{61}{64}$ | |
| 1.1094 | $1\frac{7}{64}$ | | 1.5354 | | 39. | 1.9685 | | 50. |
| 1.1220 | | 28.5 | 1.5469 | $1\frac{35}{64}$ | | 1.9687 | $1\frac{31}{32}$ | |
| 1.1250 | 1⅛ | | 1.5551 | | 39.5 | 1.9844 | $1\frac{63}{64}$ | |
| 1.1406 | $1\frac{9}{64}$ | | 1.5625 | $1\frac{9}{16}$ | | 1.9882 | | 50.5 |
| 1.1417 | | 29. | 1.5748 | | 40. | 2.0000 | 2 | |
| 1.1562 | $1\frac{5}{32}$ | | 1.5781 | $1\frac{37}{64}$ | | 2.0079 | | 51. |
| 1.1614 | | 29.5 | 1.5937 | $1\frac{19}{32}$ | | 2.0156 | $2\frac{1}{64}$ | |
| 1.1719 | $1\frac{11}{64}$ | | 1.5945 | | 40.5 | 2.0276 | | 51.5 |
| 1.1811 | | 30. | 1.6094 | $1\frac{39}{64}$ | | 2.0312 | $2\frac{1}{32}$ | |
| 1.1875 | $1\frac{3}{16}$ | | 1.6142 | | 41. | 2.0469 | $2\frac{3}{64}$ | |
| 1.2008 | | 30.5 | 1.6250 | 1⅝ | | 2.0473 | | 52. |
| 1.2031 | $1\frac{13}{64}$ | | 1.6339 | | 41.5 | 2.0625 | $2\frac{1}{16}$ | |
| 1.2187 | $1\frac{7}{32}$ | | 1.6406 | $1\frac{41}{64}$ | | 2.0669 | | 52.5 |
| 1.2205 | | 31. | 1.6536 | | 42. | 2.0781 | $2\frac{5}{64}$ | |
| 1.2344 | $1\frac{15}{64}$ | | 1.6562 | $1\frac{21}{32}$ | | 2.0867 | | 53. |
| 1.2402 | | 31.5 | 1.6719 | $1\frac{43}{64}$ | | 2.0937 | $2\frac{3}{32}$ | |
| 1.2500 | 1¼ | | 1.6732 | | 42.5 | 2.1063 | | 53.5 |
| 1.2599 | | 32. | 1.6875 | $1\frac{11}{16}$ | | 2.1094 | $2\frac{7}{64}$ | |
| 1.2656 | $1\frac{17}{64}$ | | 1.6929 | | 43. | 2.1250 | 2⅛ | |
| 1.2795 | | 32.5 | 1.7031 | $1\frac{45}{64}$ | | 2.1260 | | 54. |
| 1.2812 | $1\frac{9}{32}$ | | 1.7126 | | 43.5 | 2.1406 | $2\frac{9}{64}$ | |
| 1.2969 | $1\frac{19}{64}$ | | 1.7187 | $1\frac{23}{32}$ | | 2.1457 | | 54.5 |
| 1.2992 | | 33. | 1.7323 | | 44. | 2.1562 | $2\frac{5}{32}$ | |
| 1.3125 | $1\frac{5}{16}$ | | 1.7344 | $1\frac{47}{64}$ | | 2.1654 | | 55. |
| 1.3189 | | 33.5 | 1.7500 | 1¾ | | 2.1719 | $2\frac{11}{64}$ | |
| 1.3281 | $1\frac{21}{64}$ | | 1.7520 | | 44.5 | 2.1850 | | 55.5 |
| 1.3386 | | 34. | 1.7656 | $1\frac{49}{64}$ | | 2.1875 | $2\frac{3}{16}$ | |
| 1.3437 | $1\frac{11}{32}$ | | 1.7717 | | 45. | 2.2031 | $2\frac{13}{64}$ | |
| 1.3583 | | 34.5 | 1.7812 | $1\frac{25}{32}$ | | 2.2047 | | 56. |
| 1.3594 | $1\frac{23}{64}$ | | 1.7914 | | 45.5 | 2.2187 | $2\frac{7}{32}$ | |
| 1.3750 | 1⅜ | | 1.7969 | $1\frac{51}{64}$ | | 2.2244 | | 56.5 |
| 1.3780 | | 35. | 1.8110 | | 46. | 2.2344 | $2\frac{15}{64}$ | |
| 1.3906 | $1\frac{25}{64}$ | | 1.8125 | $1\frac{13}{16}$ | | 2.2441 | | 57. |
| 1.3977 | | 35.5 | 1.8281 | $1\frac{53}{64}$ | | 2.2500 | 2¼ | |
| 1.4062 | $1\frac{13}{32}$ | | 1.8307 | | 46.5 | 2.2638 | | 57.5 |
| 1.4173 | | 36. | 1.8437 | $1\frac{27}{32}$ | | 2.2656 | $2\frac{17}{64}$ | |
| 1.4219 | $1\frac{27}{64}$ | | 1.8504 | | 47. | 2.2812 | $2\frac{9}{32}$ | |

# Decimal Equivalents of Regular Sizes

| Decimal | Inch | m/m | Decimal | Inch | m/m | Decimal | Inch |
|---|---|---|---|---|---|---|---|
| 2.2835 | | 58. | 2.7165 | | 69. | 3.2500 | 3 1/4 |
| 2.2969 | 2 19/64 | | 2.7187 | 2 23/32 | | 3.2656 | 3 17/64 |
| 2.3031 | | 58.5 | 2.7344 | 2 47/64 | | 3.2812 | 3 9/32 |
| 2.3125 | 2 5/16 | | 2.7362 | | 69.5 | 3.2969 | 3 19/64 |
| 2.3228 | | 59. | 2.7500 | 2 3/4 | | 3.3125 | 3 5/16 |
| 2.3281 | 2 21/64 | | 2.7559 | | 70. | 3.3281 | 3 21/64 |
| 2.3425 | | 59.5 | 2.7656 | 2 49/64 | | 3.3437 | 3 11/32 |
| 2.3437 | 2 11/32 | | 2.7756 | | 70.5 | 3.3594 | 3 23/64 |
| 2.3594 | 2 23/64 | | 2.7812 | 2 25/32 | | 3.3750 | 3 3/8 |
| 2.3622 | | 60. | 2.7953 | | 71. | 3.3906 | 3 25/64 |
| 2.3750 | 2 3/8 | | 2.7969 | 2 51/64 | | 3.4062 | 3 13/32 |
| 2.3819 | | 60.5 | 2.8125 | 2 13/16 | | 3.4219 | 3 27/64 |
| 2.3906 | 2 25/64 | | 2.8150 | | 71.5 | 3.4375 | 3 7/16 |
| 2.4016 | | 61. | 2.8281 | 2 53/64 | | 3.4531 | 3 29/64 |
| 2.4062 | 2 13/32 | | 2.8346 | | 72. | 3.4687 | 3 15/32 |
| 2.4213 | | 61.5 | 2.8437 | 2 27/32 | | 3.4844 | 3 31/64 |
| 2.4219 | 2 27/64 | | 2.8543 | | 72.5 | 3.5000 | 3 1/2 |
| 2.4375 | 2 7/16 | | 2.8594 | 2 55/64 | | 3.5156 | 3 33/64 |
| 2.4409 | | 62. | 2.8740 | | 73. | 3.5312 | 3 17/32 |
| 2.4531 | 2 29/64 | | 2.8750 | 2 7/8 | | 3.5469 | 3 35/64 |
| 2.4606 | | 62.5 | 2.8906 | 2 57/64 | | 3.5625 | 3 9/16 |
| 2.4687 | 2 15/32 | | 2.8937 | | 73.5 | 3.5781 | 3 37/64 |
| 2.4803 | | 63. | 2.9062 | 2 29/32 | | 3.5937 | 3 19/32 |
| 2.4844 | 2 31/64 | | 2.9134 | | 74. | 3.6093 | 3 39/64 |
| 2.5000 | 2 1/2 | 63.5 | 2.9219 | 2 59/64 | | 3.6250 | 3 5/8 |
| 2.5156 | 2 33/64 | | 2.9331 | | 74.5 | 3.6406 | 3 41/64 |
| 2.5197 | | 64. | 2.9375 | 2 15/16 | | 3.6562 | 3 21/32 |
| 2.5312 | 2 17/32 | | 2.9527 | | 75. | 3.6719 | 3 43/64 |
| 2.5394 | | 64.5 | 2.9531 | 2 61/64 | | 3.6875 | 3 11/16 |
| 2.5469 | 2 35/64 | | 2.9687 | 2 31/32 | | 3.7031 | 3 45/64 |
| 2.5590 | | 65. | 2.9724 | | 75.5 | 3.7187 | 3 23/32 |
| 2.5625 | 2 9/16 | | 2.9844 | 2 63/64 | | 3.7344 | 3 47/64 |
| 2.5781 | 2 37/64 | | 2.9921 | | 76. | 3.7500 | 3 3/4 |
| 2.5787 | | 65.5 | 3.0000 | 3 | | 3.7656 | 3 49/64 |
| 2.5937 | 2 19/32 | | 3.0156 | 3 1/64 | | 3.7812 | 3 25/32 |
| 2.5984 | | 66. | 3.0312 | 3 1/32 | | 3.7969 | 3 51/64 |
| 2.6093 | 2 39/64 | | 3.0469 | 3 3/64 | | 3.8125 | 3 13/16 |
| 2.6181 | | 66.5 | 3.0625 | 3 1/16 | | 3.8281 | 3 53/64 |
| 2.6250 | 2 5/8 | | 3.0781 | 3 5/64 | | 3.8437 | 3 27/32 |
| 2.6378 | | 67. | 3.0937 | 3 3/32 | | 3.8594 | 3 55/64 |
| 2.6406 | 2 41/64 | | 3.1094 | 3 7/64 | | 3.8750 | 3 7/8 |
| 2.6562 | 2 21/32 | | 3.1250 | 3 1/8 | | 3.8906 | 3 57/64 |
| 2.6575 | | 67.5 | 3.1406 | 3 9/64 | | 3.9062 | 3 29/32 |
| 2.6719 | 2 43/64 | | 3.1562 | 3 5/32 | | 3.9219 | 3 59/64 |
| 2.6772 | | 68. | 3.1719 | 3 11/64 | | 3.9375 | 3 15/16 |
| 2.6875 | 2 11/16 | | 3.1875 | 3 3/16 | | 3.9531 | 3 61/64 |
| 2.6968 | | 68.5 | 3.2031 | 3 13/64 | | 3.9687 | 3 31/32 |
| 2.7031 | 2 45/64 | | 3.2187 | 3 7/32 | | 3.9844 | 3 63/64 |
| | | | 3.2344 | 3 15/64 | | 4.0000 | 4 |

## Values of Fractional Sizes Expressed in Millimeters

| Fractional Sizes | | 1 Inch | 2 Inch | 3 Inch | 4 Inch | 5 Inch | 6 Inch |
|---|---|---|---|---|---|---|---|
| | | 25.4 | 50.8 | 76.2 | 101.6 | 127. | 152.4 |
| 1/64 | 0.40 | 25.80 | 51.20 | 76.60 | 102. | 127.39 | 152.79 |
| 1/32 | 0.79 | 26.19 | 51.59 | 76.99 | 102.39 | 127.79 | 153.19 |
| 3/64 | 1.19 | 26.59 | 51.99 | 77.39 | 102.79 | 128.19 | 153.59 |
| 1/16 | 1.59 | 26.99 | 52.39 | 77.79 | 103.19 | 128.59 | 153.98 |
| 5/64 | 1.98 | 27.38 | 52.78 | 78.18 | 103.58 | 128.98 | 154.38 |
| 3/32 | 2.38 | 27.78 | 53.18 | 78.58 | 103.98 | 129.38 | 154.78 |
| 7/64 | 2.77 | 28.17 | 53.58 | 78.98 | 104.37 | 129.78 | 155.18 |
| ⅛ | 3.17 | 28.57 | 53.97 | 79.37 | 104.77 | 130.17 | 155.57 |
| 9/64 | 3.57 | 28.97 | 54.37 | 79.77 | 105.17 | 130.57 | 155.97 |
| 5/32 | 3.97 | 29.37 | 54.77 | 80.17 | 105.57 | 130.97 | 156.37 |
| 11/64 | 4.37 | 29.76 | 55.16 | 80.56 | 105.96 | 131.36 | 156.76 |
| 3/16 | 4.76 | 30.16 | 55.56 | 80.96 | 106.36 | 131.76 | 157.16 |
| 13/64 | 5.16 | 30.56 | 55.96 | 81.36 | 106.76 | 132.16 | 157.56 |
| 7/32 | 5.56 | 30.96 | 56.36 | 81.75 | 107.16 | 132.55 | 157.95 |
| 15/64 | 5.95 | 31.35 | 56.75 | 82.15 | 107.55 | 132.95 | 158.35 |
| ¼ | 6.35 | 31.75 | 57.15 | 82.55 | 107.95 | 133.35 | 158.75 |
| 17/64 | 6.75 | 32.15 | 57.55 | 82.95 | 108.34 | 133.74 | 159.14 |
| 9/32 | 7.14 | 32.54 | 57.94 | 83.34 | 108.74 | 134.14 | 159.54 |
| 19/64 | 7.54 | 32.94 | 58.34 | 83.74 | 109.14 | 134.54 | 159.94 |
| 5/16 | 7.94 | 33.34 | 58.74 | 84.14 | 109.54 | 134.94 | 160.33 |
| 21/64 | 8.33 | 33.73 | 59.13 | 84.53 | 109.93 | 135.33 | 160.73 |
| 11/32 | 8.73 | 34.13 | 59.53 | 84.93 | 110.33 | 135.73 | 161.13 |
| 23/64 | 9.13 | 34.53 | 59.93 | 85.33 | 110.73 | 136.13 | 161.53 |
| ⅜ | 9.52 | 34.92 | 60.32 | 85.72 | 111.12 | 136.52 | 161.92 |
| 25/64 | 9.92 | 35.32 | 60.72 | 86.12 | 111.52 | 136.92 | 162.32 |
| 13/32 | 10.32 | 35.72 | 61.12 | 86.52 | 111.92 | 137.32 | 162.72 |
| 27/64 | 10.72 | 36.11 | 61.51 | 86.91 | 112.31 | 137.71 | 163.11 |
| 7/16 | 11.11 | 36.51 | 61.91 | 87.31 | 112.71 | 138.11 | 163.51 |
| 29/64 | 11.51 | 36.91 | 62.31 | 87.71 | 113.11 | 138.51 | 163.91 |
| 15/32 | 11.91 | 37.31 | 62.71 | 88.1 | 113.5 | 138.9 | 164.3 |
| 31/64 | 12.3 | 37.7 | 63.1 | 88.5 | 113.9 | 139.3 | 164.7 |
| ½ | 12.7 | 38.1 | 63.5 | 88.9 | 114.3 | 139.7 | 165.1 |

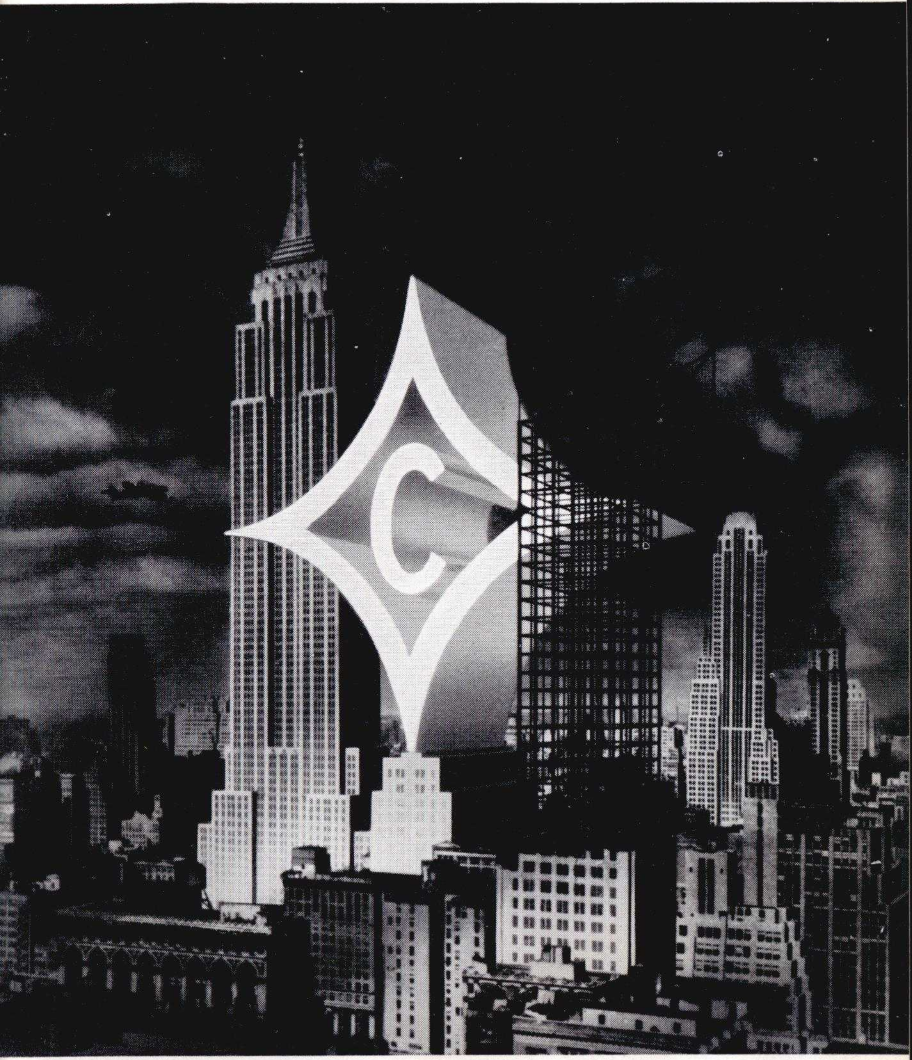
**Continued on next page**

## Values of Fractional Sizes Expressed in Millimeters

| Fractional Sizes | | 1 Inch | 2 Inch | 3 Inch | 4 Inch | 5 Inch | 6 Inch |
|---|---|---|---|---|---|---|---|
| 33/64 | 13.10 | 38.49 | 63.90 | 89.3 | 114.69 | 140.09 | 165.49 |
| 17/32 | 13.49 | 38.89 | 64.29 | 89.69 | 115.09 | 140.49 | 165.89 |
| 35/64 | 13.89 | 39.29 | 64.69 | 90.09 | 115.49 | 140.89 | 166.29 |
| 9/16 | 14.29 | 39.69 | 65.09 | 90.49 | 115.89 | 141.29 | 166.68 |
| 37/64 | 14.68 | 40.08 | 65.48 | 90.88 | 116.28 | 141.68 | 167.08 |
| 19/32 | 15.08 | 40.48 | 65.88 | 91.28 | 116.68 | 142.08 | 167.48 |
| 39/64 | 15.48 | 40.88 | 66.28 | 91.68 | 117.08 | 142.48 | 167.88 |
| 5/8 | 15.87 | 41.27 | 66.67 | 92.07 | 117.47 | 142.87 | 168.27 |
| 41/64 | 16.27 | 41.67 | 67.07 | 92.47 | 117.87 | 143.27 | 168.67 |
| 21/32 | 16.67 | 42.07 | 67.47 | 92.87 | 118.27 | 143.67 | 169.07 |
| 43/64 | 17.07 | 42.46 | 67.86 | 93.26 | 118.66 | 144.06 | 169.46 |
| 11/16 | 17.46 | 42.86 | 68.26 | 93.66 | 119.06 | 144.46 | 169.86 |
| 45/64 | 17.86 | 43.26 | 68.66 | 94.06 | 119.46 | 144.86 | 170.26 |
| 23/32 | 18.26 | 43.66 | 69.05 | 94.45 | 119.85 | 145.25 | 170.65 |
| 47/64 | 18.65 | 44.05 | 69.45 | 94.85 | 120.25 | 145.65 | 171.05 |
| 3/4 | 19.05 | 44.45 | 69.85 | 95.25 | 120.65 | 146.05 | 171.45 |
| 49/64 | 19.45 | 44.85 | 70.25 | 95.65 | 121.04 | 146.44 | 171.84 |
| 25/32 | 19.84 | 45.24 | 70.64 | 96.04 | 121.44 | 146.84 | 172.24 |
| 51/64 | 20.24 | 45.64 | 71.04 | 96.44 | 121.84 | 147.24 | 172.64 |
| 13/16 | 20.64 | 46.04 | 71.44 | 96.84 | 122.24 | 147.63 | 173.03 |
| 53/64 | 21.03 | 46.43 | 71.83 | 97.23 | 122.63 | 148.03 | 173.43 |
| 27/32 | 21.43 | 46.83 | 72.23 | 97.63 | 123.03 | 148.43 | 173.83 |
| 55/64 | 21.83 | 47.23 | 72.63 | 98.03 | 123.43 | 148.83 | 174.22 |
| 7/8 | 22.22 | 47.62 | 73.02 | 98.42 | 123.82 | 149.22 | 174.62 |
| 57/64 | 22.62 | 48.02 | 73.42 | 98.82 | 124.22 | 149.62 | 175.02 |
| 29/32 | 23.02 | 48.42 | 73.82 | 99.22 | 124.62 | 150.02 | 175.42 |
| 59/64 | 23.42 | 48.81 | 74.21 | 99.61 | 125.01 | 150.41 | 175.81 |
| 15/16 | 23.81 | 49.21 | 74.61 | 100.01 | 125.41 | 150.81 | 176.21 |
| 61/64 | 24.21 | 49.61 | 75.01 | 100.41 | 125.81 | 151.21 | 176.61 |
| 31/32 | 24.61 | 50.01 | 75.4 | 100.8 | 126.2 | 151.6 | 177. |
| 63/64 | 25. | 50.4 | 75.8 | 101.2 | 126.6 | 152. | 177.4 |

1 Millimeter = .03937 inch.

# PRIVATE CODE—AND INDEX



FOR ALPHABETICAL INDEX, SEE PAGES 221-229

FOR NUMERICAL INDEX, SEE PAGES 230-240

# CODE

## For Customer's Use

| Code | |
|---|---|
| Asa | *Add* to our order............ |
| Asafetida | Can you ship at once? |
| Asaphus | Cancel order............ |
| Asarone | *Diameter* asked for is............ |
| Asbestic | Duplicate order............ |
| Asbestine | Have you *received* our *letter* of............? |
| Asbestous | Have you *received* our *telegram* of............? |
| Asbolin | Have you *shipped* our *order*............? |
| Ascarid | Hold invoice for confirming order. |
| Ascend | *Hold* order for shipping instructions. |
| Ascendable | *Hold* order............until further advised. |
| Ascendance | If not in stock, cancel and wire us. |
| Ascendant | *List No*............ wanted for our order........ |
| Ascendency | Please *reply* to our *letter* of............ |
| Ascendible | Please *reply* to our *telegram* of............ |
| Ascending | *Quantity* asked for is............ |
| Ascension | *Refer* to your *letter* of............ |
| Ascensive | *Refer* to your *telegram* of............ |
| Ascent | *Sample* will be sent for order............ |
| Ascertain | Send duplicate invoice of shipment............ |
| Ascetic | Ship all you can and advise delivery on balance before entering. |
| Ascham | Ship all you can and cancel balance, and advise. |
| Ascian | Ship all you can, cancel balance, and wire us what is short. |
| Ascidian | Ship all you can by express, balance as soon as possible. |
| Ascidiform | Ship all you can by freight, balance by express. |
| Ascidium | Ship all you can by freight, balance by parcel post. |
| Ascitic | Ship all you can by parcel post, balance as soon as possible. |
| Ascitical | Ship............by express, balance by freight. |
| Ascribe | Ship by air express. |
| Ascript | Ship by air mail. |
| Ash | Ship by express. |
| Ashame | Ship by freight. |
| Ashen | Ship by parcel post. |
| Ashfire | Ship by parcel post insured. |
| Ashine | Ship by parcel post special delivery. |

## Code—For Customer's Use *(Continued)*

| Code | |
|---|---|
| Ashler | Ship by parcel post special delivery insured. |
| Ashore | Ship by parcel post special handling. |
| Ashy | Ship by parcel post special handling special delivery. |
| Asian | Ship by steamer. |
| Asiarch | Ship............if in stock or quote price and delivery. |
| Asiatic | Ship............if it can be furnished in.........days. |
| Aside | Ship............if it can be furnished in.........weeks. |
| Asilus | Ship immediately with other goods ready, by express. |
| Asinego | Ship immediately with other goods ready, by freight. |
| Asinine | Ship immediately with other goods ready, by parcel post. |
| Ask | Ship order complete. |
| Askance | Ship our order via............railway. |
| Askant | *Straight shank* tools wanted on our order ......... |
| Asker | *Taper shank* tools wanted on our order ........... |
| Askew | *Trace* shipment of our order............ |
| Asking | We accept your proposition. Consider this an order. Will confirm. |
| Aslake | We have *received* your *letter* of............ |
| Aslant | We have *received* your *telegram* of............ |
| Aslope | We have not received any word from you. Let us hear. |
| Aslug | We have written you on the subject. |
| Asmear | When will you ship our order............? |
| Asonant | Wire delivery. |
| Asp | Wire if not in stock. |
| Aspartic | Wire us if shipping. |
| Aspect | Wire what action you are taking. |

## CODE—For Our Use

| | |
|---|---|
| Asquint | Best delivery on order............ |
| Assail | Cannot cancel order. See our letter of today. |
| Assailable | Do not understand your order............ Compare with our Catalog and give list numbers. |
| Assailant | Do you want carbon or high speed for order.......? |

## Code—For Our Use *(Continued)*

| Code | |
|---|---|
| Assailer | Do you want straight or taper shank tools for your order............ |
| Assapan | Give diameter............ |
| Assart | Give quantity wanted for............ |
| Assassin | Have not received order referred to. |
| Assation | How do you want us to ship. |
| Assault | In stock subject to prior sale. |
| Assay | Instructions too late. Have shipped order......... |
| Assayer | Must have information asked for before we can go ahead. |
| Assecure | Must have sample or sketch for order............ |
| Assemble | Order............shipped by express............ |
| Assembly | Order............shipped by freight............ |
| Assent | Order............your telegram today will be shipped............ |
| Assenter | Prices quoted are net. |
| Assenting | Referring to your letter of............we quote ............each net. |
| Assentive | Referring to your letter of............we quote ............dozen net. |
| Assert | Send sample at once. |
| Asserter | Shall we enter? |
| Assertion | Tools ordered are special and not carried in stock. |
| Assertive | We are shipping. |
| Assertor | We are shipping order ..................today except............ |
| Assess | We are shipping today.........on order......... Balance............ |
| Assessment | We cannot ship order at once. Tools special. Will take until............ |
| Assessor | We can ship............ |
| Asset | We can ship at once. |
| Assiege | We can ship within.........days. Shall we enter? |
| | Note:—See code words under quantities for number of days. |
| Assign | We can ship in about 1 week. |
| Assignable | We can ship in about 2 weeks. |
| Assignee | We can ship in about 3 weeks. |
| Assignor | We can ship in about 4 weeks. |
| Assimilate | We can ship order except special tools. |
| Assist | We quote............each net. |

## Code—For Our Use (*Continued*)

| Code | |
|---|---|
| Assistance | We quote............net lot. |
| Assistant | We quote............per dozen net. |
| Associate | We quote regular list less discount of............ |
| Assoil | We quote regular list *plus*............ |
| Assonant | What style, size, shank or length shall we furnish? |
| Assort | Your order............complete. How shall we ship? |

## Prices

5%—Facade
10%—Face
15%—Faceache
20%—Facedge
25%—Faceharden
30%—Faceless
33⅓%–Facestone
35%—Facetious
40%—Facial
45%—Facility
50%—Facsimile
55%—Factional
60%—Factor
65%—Factotum
66⅔%–Facture
70%—Faculty
75%—Faddist
80%—Fading

5–5%—Fiber
10–5%—Fibrinous
15–5%—Fibroid
20–5%—Fibula
25–5%—Fickle
30–5%—Fiction
33⅓–5%–Fiddle
35–5%—Fiddlewood
40–5%—Fidelity
45–5%—Fidgety
50–5%—Fiduciary
55–5%—Fieldcress
60–5%—Fieldhand
65–5%—Fieldsman
66⅔–5%–Fiendish
70–5%—Figaro
75–5%—Figleaf
80–5%—Figurate

5–10%—Foam
10–10%—Fobchain
15–10%—Focusing
20–10%—Fogeater
25–10%—Fogram
30–10%—Foil
33⅓–10%–Folding
35–10%—Foliate
40–10%—Folkland
45–10%—Following
50–10%—Fondant
55–10%—Fontanel
60–10%—Foolhardy
65–10%—Footbridge
66⅔–10%–Footguard
70–10%—Footmark
75–10%—Forage
80–10%—Forbidden

## Example

**Information wanted by us**

"Do not understand your order 2465; compare with our Catalog and give list numbers." **Code Words:** Assailable, Baker, Bard.

## Reply to Above

List number 516 wanted for our No. 2465. **Code Words:** Ascendent, Loop, Baker, Bard.

# Table of Dates

Taken from the Adams Cable Codex by permission of Messrs. F. O. Houghton & Co., Boston, Mass., New England Agents of the Red Star Line of Steamers. For example, "Armsberg" would mean first of January.

| Date | Beginning for the day |
|---|---|
| First | Arms |
| Second | Aron |
| Third | Ash |
| Fourth | Attle |
| Fifth | Baron |
| Sixth | Beach |
| Seventh | Bloom |
| Eighth | Brown |
| Ninth | Barro |
| Tenth | Clark |
| Eleventh | Clay |
| Twelfth | Cake |
| Thirteenth | Cole |
| Fourteenth | Dress |
| Fifteenth | Devon |
| Sixteenth | Dun |
| Seventeenth | Eden |
| Eighteenth | Elgin |
| Nineteenth | Eton |
| Twentieth | Fair |
| Twenty-first | Glen |
| Twenty-second | Green |
| Twenty-third | Hazel |
| Twenty-fourth | Lees |
| Twenty-fifth | Lynn |
| Twenth-sixth | Olden |
| Twenty-seventh | Oster |
| Twenty-eighth | Pitts |
| Twenty-ninth | Plain |
| Thirtieth | Raven |
| Thirty-first | Rock |

| Ending for the month | Month |
|---|---|
| Berg | January |
| Boro | February |
| Dorf | March |
| Dale | April |
| Field | May |
| Ford | June |
| Ham | July |
| Mont | August |
| Shire | September |
| Ton | October |
| Ville | November |
| Wood | December |

## Example

### Information wanted

"Do not understand your order March third. Compare with our Catalog, and give List Numbers." **Code Words:** "Assailable, Ashdorf."

## Reply to Above

"Want list number 608 for our order March third." **Code Words:** "Ascendent, Lowcow, Ashdorf."

# Quantities

| | Code | | Code | | Code |
|---|---|---|---|---|---|
| 1 | Baby | 53 | Banister | 105 | Bastinado |
| 2 | Babyish | 54 | Banjo | 106 | Basting |
| 3 | Babylon | 55 | Banner | 107 | Batavian |
| 4 | Bachelor | 56 | Bannock | 108 | Bateful |
| 5 | Backbite | 57 | Banquet | 109 | Bateless |
| 6 | Backbone | 58 | Bantam | 110 | Bath |
| 7 | Backdoor | 59 | Baptist | 111 | Bather |
| 8 | Backing | 60 | Barbara | 112 | Bathetic |
| 9 | Backside | 61 | Barbarism | 113 | Bathos |
| 10 | Backward | 62 | Barbarity | 114 | Bating |
| 11 | Baden | 63 | Barbecue | 115 | Batiste |
| 12 | Badge | 64 | Barber | 116 | Batlet |
| 13 | Badinage | 65 | Bard | 117 | Batman |
| 14 | Badly | 66 | Bardell | 118 | Batmoney |
| 15 | Badness | 67 | Bardish | 119 | Batshell |
| 16 | Baffle | 68 | Bardism | 120 | Battable |
| 17 | Bag | 69 | Barking | 121 | Battalion |
| 18 | Bagdad | 70 | Barkis | 122 | Batteller |
| 19 | Bagman | 71 | Barkless | 123 | Battledoor |
| 20 | Bagpipe | 72 | Barkpit | 124 | Battlement |
| 21 | Bagstock | 73 | Barmaid | 125 | Battling |
| 22 | Bailiff | 74 | Barn | 126 | Battology |
| 23 | Bain | 75 | Barnabas | 127 | Battue |
| 24 | Baker | 76 | Barnaby | 128 | Battuta |
| 25 | Bakery | 77 | Barnacle | 129 | Batz |
| 26 | Balcony | 78 | Baroness | 130 | Baubee |
| 27 | Bald | 79 | Barony | 131 | Baudekin |
| 28 | Baldhead | 80 | Barosma | 132 | Bauge |
| 29 | Baldness | 81 | Barouche | 133 | Bauhinia |
| 30 | Baldpate | 82 | Barrack | 134 | Bauk |
| 31 | Baldric | 83 | Barrister | 135 | Baulite |
| 32 | Baldwin | 84 | Barrow | 136 | Bavaroy |
| 33 | Balky | 85 | Barry | 137 | Bavin |
| 34 | Ball | 86 | Barton | 138 | Bawbling |
| 35 | Ballad | 87 | Bartram | 139 | Bawcock |
| 36 | Balloon | 88 | Barytone | 140 | Bawdrick |
| 37 | Balm | 89 | Basalt | 141 | Bawdry |
| 38 | Balmoral | 90 | Baseless | 142 | Bawn |
| 39 | Balmy | 91 | Basely | 143 | Bawrel |
| 40 | Balsam | 92 | Basement | 144 | Bawsin |
| 41 | Baluster | 93 | Bashaw | 145 | Baxter |
| 42 | Bamberg | 94 | Bashful | 146 | Bayadere |
| 43 | Bamboo | 95 | Basil | 147 | Bayardly |
| 44 | Bamoth | 96 | Basilisk | 148 | Bayberry |
| 45 | Banana | 97 | Bask | 149 | Baylaurel |
| 46 | Bandage | 98 | Basket | 150 | Bayman |
| 47 | Bandbox | 99 | Bass | 151 | Bayne |
| 48 | Bandit | 100 | Bassett | 152 | Bayonet |
| 49 | Bandog | 101 | Bassinet | 153 | Bayou |
| 50 | Baneful | 102 | Bassoon | 154 | Baysalt |
| 51 | Banian | 103 | Bastard | 155 | Baytree |
| 52 | Banish | 104 | Bastile | 156 | Baywindow |

## Quantities (*Continued*)

| | Code | | Code | | Code |
|---|---|---|---|---|---|
| 157 | Bayyarn | 208 | Beatitude | 259 | Betuline |
| 158 | Bazat | 209 | Beaufin | 260 | Betwixt |
| 159 | Beach | 210 | Beaupeer | 261 | Beverage |
| 160 | Beached | 211 | Beauship | 262 | Bewail |
| 161 | Beaching | 212 | Beautiful | 263 | Bewilder |
| 162 | Beachy | 213 | Beautify | 264 | Beylick |
| 163 | Beacon | 214 | Beaverrat | 265 | Beyond |
| 164 | Beaconage | 215 | Became | 266 | Bezoar |
| 165 | Beaconing | 216 | Becard | 267 | Biaxal |
| 166 | Beaconless | 217 | Bechance | 268 | Bibacious |
| 167 | Beadlery | 218 | Bechic | 269 | Biblus |
| 168 | Beadman | 219 | Becket | 270 | Biceps |
| 169 | Beadproof | 220 | Beclip | 271 | Bickern |
| 170 | Beadroll | 221 | Becoming | 272 | Bicolor |
| 171 | Beads | 222 | Becurl | 273 | Bicuspis |
| 172 | Beadsman | 223 | Bedaff | 274 | Bidden |
| 173 | Beadsnake | 224 | Bedale | 275 | Biform |
| 174 | Beadtool | 225 | Bedared | 276 | Bifurcate |
| 175 | Beadtree | 226 | Bedazzle | 277 | Bigamy |
| 176 | Beagle | 227 | Bedelry | 278 | Bigaroon |
| 177 | Beakiron | 228 | Bedight | 279 | Bigness |
| 178 | Beaks | 229 | Bedim | 280 | Bigotry |
| 179 | Beals | 230 | Bedizen | 281 | Bijou |
| 180 | Beam | 231 | Bedlamite | 282 | Bijugate |
| 181 | Beambird | 232 | Bedlinen | 283 | Bilander |
| 182 | Beamed | 233 | Bedmate | 284 | Bilberry |
| 183 | Beamful | 234 | Bedouins | 285 | Bilge |
| 184 | Beaming | 235 | Bedplate | 286 | Bilimbi |
| 185 | Beamless | 236 | Bedpost | 287 | Bilingual |
| 186 | Beamy | 237 | Bedquilt | 288 | Bilious |
| 187 | Beancaper | 238 | Bedrench | 289 | Bilk |
| 188 | Beancod | 239 | Bedrid | 290 | Billfish |
| 189 | Beanfed | 240 | Bedrop | 291 | Billiards |
| 190 | Beanfly | 241 | Bedside | 292 | Billman |
| 191 | Bearable | 242 | Bengalese | 293 | Billow |
| 192 | Bearberry | 243 | Benignly | 294 | Bilobed |
| 193 | Bearbind | 244 | Benjamin | 295 | Bime |
| 194 | Bearded | 245 | Benkit | 296 | Bimedial |
| 195 | Bearfly | 246 | Benumb | 297 | Bimensal |
| 196 | Bearherd | 247 | Benzoic | 298 | Binary |
| 197 | Bearing | 248 | Benzoyl | 299 | Binate |
| 198 | Bearish | 249 | Berlash | 300 | Binding |
| 199 | Bearlike | 250 | Berley | 301 | Bindwood |
| 200 | Bearsear | 251 | Berlin | 302 | Binnacle |
| 201 | Bearskin | 252 | Bertram | 303 | Binomial |
| 202 | Bearward | 253 | Beryl | 304 | Binous |
| 203 | Beastings | 254 | Besiege | 305 | Binoxide |
| 204 | Beastler | 255 | Bestial | 306 | Biology |
| 205 | Beat | 256 | Betake | 307 | Biotine |
| 206 | Beaten | 257 | Betony | 308 | Bipedal |
| 207 | Beatific | 258 | Betrothal | 309 | Bipinnate |

## Quantities (*Continued*)

| | Code | | Code | | Code |
|---|---|---|---|---|---|
| 310 | Biplicate | 361 | Blazonry | 412 | Boatlike |
| 311 | Bipolar | 362 | Bleaching | 413 | Boatman |
| 312 | Bipont | 363 | Bleakness | 414 | Boatswain |
| 313 | Birchen | 364 | Bleed | 415 | Bobbery |
| 314 | Birdman | 365 | Blemish | 416 | Bobbinet |
| 315 | Bireme | 366 | Blending | 417 | Bobcherry |
| 316 | Birlaw | 367 | Blenny | 418 | Bobolink |
| 317 | Birman | 368 | Bless | 419 | Bobstay |
| 318 | Birthday | 369 | Bletting | 420 | Bobtail |
| 319 | Bisect | 370 | Bleyme | 421 | Bocal |
| 320 | Biserial | 371 | Blighted | 422 | Bocardo |
| 321 | Bisetose | 372 | Blindage | 423 | Bocasine |
| 322 | Bishop | 373 | Blindfold | 424 | Bocca |
| 323 | Bismuthal | 374 | Blindly | 425 | Bockelet |
| 324 | Bisogno | 375 | Blinking | 426 | Bocking |
| 325 | Bissac | 376 | Blissful | 427 | Bockland |
| 326 | Bistoury | 377 | Blistering | 428 | Bodeful |
| 327 | Bistre | 378 | Blithely | 429 | Bodement |
| 328 | Bisulcous | 379 | Bloater | 430 | Bodiless |
| 329 | Biter | 380 | Block | 431 | Boding |
| 330 | Bitingly | 381 | Blockade | 432 | Bodkin |
| 331 | Bittern | 382 | Blockish | 433 | Bodleian |
| 332 | Bitterness | 383 | Blomary | 434 | Body |
| 333 | Bitumen | 384 | Blondlace | 435 | Boeotian |
| 334 | Bivalved | 385 | Bloody | 436 | Bogbean |
| 335 | Biventral | 386 | Blossomy | 437 | Bogberry |
| 336 | Bivouac | 387 | Blotting | 438 | Bogland |
| 337 | Bixa | 388 | Blowfly | 439 | Bogore |
| 338 | Bixwort | 389 | Blowzy | 440 | Bogus |
| 339 | Bizantine | 390 | Blubber | 441 | Bohemian |
| 340 | Bizard | 391 | Bludgeon | 442 | Boiled |
| 341 | Blab | 392 | Bluebell | 443 | Boilery |
| 342 | Blackbird | 393 | Blueness | 444 | Boilingly |
| 343 | Blacking | 394 | Bluepeter | 445 | Boldface |
| 344 | Blackly | 395 | Bluestone | 446 | Boldly |
| 345 | Blacktail | 396 | Bluffness | 447 | Boldness |
| 346 | Bladed | 397 | Bluffy | 448 | Bolero |
| 347 | Blain | 398 | Bluish | 449 | Boletus |
| 348 | Blamably | 399 | Blundering | 450 | Bollard |
| 349 | Blameless | 400 | Blunker | 451 | Bollimony |
| 350 | Blandish | 401 | Bluntly | 452 | Bollworm |
| 351 | Blanket | 402 | Blurt | 453 | Bolognian |
| 352 | Blankly | 403 | Blushy | 454 | Bolstering |
| 353 | Blare | 404 | Bluster | 455 | Bolthead |
| 354 | Blarney | 405 | Boa | 456 | Bolting |
| 355 | Blasting | 406 | Boarder | 457 | Boltonite |
| 356 | Blatant | 407 | Boast | 458 | Bolus |
| 357 | Blatter | 408 | Boastful | 459 | Bomb |
| 358 | Blauwbok | 409 | Boaston | 460 | Bombardo |
| 359 | Blaze | 410 | Boatable | 461 | Bombast |
| 360 | Blazing | 411 | Boating | 462 | Bombastic |

## Quantities (*Continued*)

| | Code | | Code | | Code |
|---|---|---|---|---|---|
| 463 | Bombazine | 514 | Bornite | 565 | Bounty |
| 464 | Bombiate | 515 | Boron | 566 | Bouquet |
| 465 | Bombyx | 516 | Borough | 567 | Bourgeois |
| 466 | Bonafide | 517 | Borrelist | 568 | Bourn |
| 467 | Bonbon | 518 | Borsella | 569 | Bournless |
| 468 | Bondman | 519 | Borsholder | 570 | Bournonite |
| 469 | Boneset | 520 | Boshbok | 571 | Bourse |
| 470 | Bonetta | 521 | Bosky | 572 | Boutade |
| 471 | Bonfire | 522 | Bossage | 573 | Boutsrimes |
| 472 | Boning | 523 | Bosset | 574 | Bovate |
| 473 | Bonito | 524 | Bossy | 575 | Boveycoal |
| 474 | Bonnet | 525 | Bosvel | 576 | Bovine |
| 475 | Bonniviss | 526 | Boswellian | 577 | Bowbearer |
| 476 | Bonus | 527 | Botanical | 578 | Bowbell |
| 477 | Bony | 528 | Botanist | 579 | Bowbent |
| 478 | Boobyish | 529 | Botany | 580 | Bowboy |
| 479 | Bookcase | 530 | Botargo | 581 | Bowcompass |
| 480 | Bookery | 531 | Botchy | 582 | Bowdrill |
| 481 | Bookful | 532 | Boteroll | 583 | Bowelless |
| 482 | Bookish | 533 | Bother | 584 | Bowels |
| 483 | Booklet | 534 | Bothnian | 585 | Boweric |
| 484 | Bookman | 535 | Botline | 586 | Bowge |
| 485 | Booksale | 536 | Botrychium | 587 | Bowgrace |
| 486 | Bookworm | 537 | Botryoid | 588 | Bowhand |
| 487 | Booly | 538 | Botryolite | 589 | Bowieknife |
| 488 | Boomerang | 539 | Bottle | 590 | Bowingly |
| 489 | Boone | 540 | Bottleale | 591 | Bowknot |
| 490 | Boorish | 541 | Bottlebump | 592 | Bowl |
| 491 | Boost | 542 | Bottlefish | 593 | Bowlay |
| 492 | Bootcrimp | 543 | Bottling | 594 | Bowlder |
| 493 | Bootkin | 544 | Bottomed | 595 | Bowlegged |
| 494 | Bootless | 545 | Bottomland | 596 | Bowless |
| 495 | Booty | 546 | Bottomless | 597 | Bowling |
| 496 | Bopeep | 547 | Bottomry | 598 | Bowman |
| 497 | Borable | 548 | Bouchet | 599 | Bowoar |
| 498 | Borachio | 549 | Boudoir | 600 | Bownet |
| 499 | Boracic | 550 | Bough | 601 | Bowpen |
| 500 | Boracite | 551 | Boughten | 602 | Bowpiece |
| 501 | Boracous | 552 | Bougie | 603 | Bowsaw |
| 502 | Boramez | 553 | Bouillon | 604 | Bowshot |
| 503 | Borax | 554 | Boulea | 605 | Bowsprit |
| 504 | Bordage | 555 | Boulevard | 606 | Bowstring |
| 505 | Bordeler | 556 | Boulten | 607 | Bowwindow |
| 506 | Border | 557 | Bouncing | 608 | Bowwow |
| 507 | Bordering | 558 | Bouncingly | 609 | Boxtree |
| 508 | Bordlode | 559 | Bound | 610 | Boxwood |
| 509 | Bordman | 560 | Boundary | 611 | Boyblind |
| 510 | Bordure | 561 | Bounder | 612 | Boyhood |
| 511 | Boreas | 562 | Boundless | 613 | Boyishly |
| 512 | Borecole | 563 | Bounteous | 614 | Boyishness |
| 513 | Boring | 564 | Bountiful | 615 | Boyism |

## Quantities (*Continued*)

| | Code | | Code | | Code |
|---|---|---|---|---|---|
| 616 | Boyn | 667 | Brassart | 718 | Breccia |
| 617 | Boyship | 668 | Brassica | 719 | Breech |
| 618 | Boysplay | 669 | Brassy | 720 | Breeching |
| 619 | Brabantine | 670 | Brat | 721 | Breeder |
| 620 | Brabbling | 671 | Braunite | 722 | Breeding |
| 621 | Braccate | 672 | Bravado | 723 | Breezeless |
| 622 | Bracelet | 673 | Bravely | 724 | Breezy |
| 623 | Bracer | 674 | Braveness | 725 | Brehon |
| 624 | Brachiate | 675 | Bravery | 726 | Brethren |
| 625 | Brachylogy | 676 | Bravingly | 727 | Brettice |
| 626 | Bracing | 677 | Bravo | 728 | Brevet |
| 627 | Bracken | 678 | Bravura | 729 | Brevetcy |
| 628 | Bracketing | 679 | Brawl | 730 | Breviate |
| 629 | Brackish | 680 | Brawling | 731 | Breviped |
| 630 | Bracteal | 681 | Brawner | 732 | Brevity |
| 631 | Bradypod | 682 | Brawniness | 733 | Brew |
| 632 | Braggart | 683 | Brawny | 734 | Brewage |
| 633 | Bragging | 684 | Braws | 735 | Brewing |
| 634 | Brahmin | 685 | Braxy | 736 | Brewis |
| 635 | Brailup | 686 | Braying | 737 | Brewster |
| 636 | Brained | 687 | Brayle | 738 | Breziline |
| 637 | Brainish | 688 | Brazed | 739 | Bribe |
| 638 | Brainless | 689 | Brazenly | 740 | Bribeless |
| 639 | Brainsick | 690 | Brazenness | 741 | Bribery |
| 640 | Braird | 691 | Brazier | 742 | Brickbat |
| 641 | Brait | 692 | Brazil | 743 | Brickclay |
| 642 | Brakeman | 693 | Braziletto | 744 | Brickdust |
| 643 | Braky | 694 | Brazillian | 745 | Brickfield |
| 644 | Brambly | 695 | Brazilnut | 746 | Brickkiln |
| 645 | Braminical | 696 | Braziltea | 747 | Bricklayer |
| 646 | Brancard | 697 | Brazilwood | 748 | Brickmaker |
| 647 | Branch | 698 | Brazing | 749 | Brickwork |
| 648 | Branchery | 699 | Breachy | 750 | Bridal |
| 649 | Branching | 700 | Breadcorn | 751 | Bridecake |
| 650 | Branchlet | 701 | Breadnut | 752 | Bridegroom |
| 651 | Brander | 702 | Breadth | 753 | Bridesman |
| 652 | Brandgoose | 703 | Breakable | 754 | Bridewell |
| 653 | Branding | 704 | Breakage | 755 | Bridgy |
| 654 | Brandiron | 705 | Breaker | 756 | Bridleport |
| 655 | Brandisher | 706 | Breaking | 757 | Bridler |
| 656 | Brandrith | 707 | Breakneck | 758 | Bridson |
| 657 | Brandy | 708 | Bream | 759 | Briefless |
| 658 | Brangler | 709 | Breaming | 760 | Briefly |
| 659 | Brangling | 710 | Breast | 761 | Briefman |
| 660 | Branks | 711 | Breastbone | 762 | Briery |
| 661 | Branlin | 712 | Breastfast | 763 | Brig |
| 662 | Brannew | 713 | Breastmark | 764 | Brigade |
| 663 | Brantfox | 714 | Breastpin | 765 | Brigadier |
| 664 | Branular | 715 | Breastwork | 766 | Brigandage |
| 665 | Brash | 716 | Breathe | 767 | Brigantine |
| 666 | Brassage | 717 | Breathing | 768 | Brighten |

## Quantities (*Continued*)

| | Code | | Code | | Code |
|---|---|---|---|---|---|
| 769 | Brighteyed | 820 | Brodekin | 871 | Brownspar |
| 770 | Brightly | 821 | Broggle | 872 | Brownstudy |
| 771 | Brightness | 822 | Brogue | 873 | Browpost |
| 772 | Brigue | 823 | Broidery | 874 | Browse |
| 773 | Brilliancy | 824 | Broil | 875 | Browsing |
| 774 | Brilliant | 825 | Broiler | 876 | Bruchus |
| 775 | Brills | 826 | Brokenly | 877 | Brucite |
| 776 | Brim | 827 | Brokenness | 878 | Bruin |
| 777 | Brimful | 828 | Brokerage | 879 | Bruiser |
| 778 | Brimless | 829 | Brokery | 880 | Bruisewort |
| 779 | Brimming | 830 | Bromal | 881 | Bruising |
| 780 | Brimsmade | 831 | Bromegrass | 882 | Brulyement |
| 781 | Brimstony | 832 | Bromine | 883 | Brumalia |
| 782 | Brindle | 833 | Bronchial | 884 | Brunette |
| 783 | Brinepit | 834 | Bronchitis | 885 | Brunion |
| 784 | Bringer | 835 | Bronchus | 886 | Brunt |
| 785 | Bringerup | 836 | Brontern | 887 | Brushiness |
| 786 | Briny | 837 | Brontolite | 888 | Brushing |
| 787 | Brisk | 838 | Brontology | 889 | Brushlike |
| 788 | Brisket | 839 | Bronze | 890 | Brushmaker |
| 789 | Briskness | 840 | Bronzite | 891 | Brushwood |
| 790 | Bristled | 841 | Brooch | 892 | Brushy |
| 791 | Bristly | 842 | Brood | 893 | Brusk |
| 792 | Brisure | 843 | Brooding | 894 | Brutal |
| 793 | Britannic | 844 | Broodmare | 895 | Brutalize |
| 794 | British | 845 | Brooklet | 896 | Brutally |
| 795 | Britishgum | 846 | Brookline | 897 | Brute |
| 796 | Briton | 847 | Brookmint | 898 | Bruteness |
| 797 | Brittle | 848 | Brookweed | 899 | Brutify |
| 798 | Brittleness | 849 | Brooky | 900 | Brutishly |
| 799 | Britzska | 850 | Broom | 901 | Brutus |
| 800 | Brize | 851 | Broomcorn | 902 | Bryony |
| 801 | Broacher | 852 | Broomland | 903 | Brython |
| 802 | Broadaxe | 853 | Broomrape | 904 | Bubbler |
| 803 | Broadbill | 854 | Broomstaff | 905 | Bubbly |
| 804 | Broadcast | 855 | Broomstick | 906 | Buboninae |
| 805 | Broadcloth | 856 | Broomy | 907 | Bubons |
| 806 | Broaden | 857 | Brosimum | 908 | Buccal |
| 807 | Broadfoot | 858 | Broth | 909 | Buccaneer |
| 808 | Broadish | 859 | Brotherly | 910 | Buccinal |
| 809 | Broadly | 860 | Brougham | 911 | Buccinite |
| 810 | Broadness | 861 | Brow | 912 | Bucco |
| 811 | Broadseal | 862 | Browbeat | 913 | Buccula |
| 812 | Broadside | 863 | Browbound | 914 | Buccutaur |
| 813 | Broadwise | 864 | Browless | 915 | Buceros |
| 814 | Brocade | 865 | Brownbill | 916 | Bucholzite |
| 815 | Brocatello | 866 | Browncoal | 917 | Bucka |
| 816 | Broccoli | 867 | Browngull | 918 | Buckbasket |
| 817 | Brochette | 868 | Browning | 919 | Buckbean |
| 818 | Brochure | 869 | Brownism | 920 | Bucket |
| 819 | Brocket | 870 | Brownrust | 921 | Bucketful |

## Quantities (*Continued*)

| Code | | Code | | Code | |
|---|---|---|---|---|---|
| 922 | Buckety | 973 | Bulamfever | 2200 | Bunchy |
| 923 | Buckeyed | 974 | Bulbaceous | 2250 | Buncomb |
| 924 | Bucking | 975 | Bulbed | 2300 | Bunder |
| 925 | Buckish | 976 | Bulbina | 2350 | Bundles |
| 926 | Buckler | 977 | Bulbul | 2400 | Bungalow |
| 927 | Buckmast | 978 | Bulge | 2450 | Bunghole |
| 928 | Buckram | 979 | Bulimy | 2500 | Bungler |
| 929 | Buckskin | 980 | Bulk | 2550 | Bungling |
| 930 | Buckstall | 981 | Bulkhead | 2600 | Bungo |
| 931 | Buckthorn | 982 | Bulkiness | 2650 | Bunker |
| 932 | Buckwheat | 983 | Bulky | 2700 | Bunnies |
| 933 | Bucolic | 984 | Bulla | 2750 | Bunny |
| 934 | Bucranes | 985 | Bullantic | 2800 | Bunsing |
| 935 | Bucraniom | 986 | Bullate | 2850 | Bunter |
| 936 | Bud | 987 | Bullbeef | 2900 | Bunting |
| 937 | Buddha | 988 | Bullcalf | 2950 | Buntline |
| 938 | Buddhist | 989 | Bullcomber | 3000 | Bunyan |
| 939 | Budding | 990 | Bulldog | 3050 | Buoyage |
| 940 | Buddle | 991 | Bulletin | 3100 | Buoyant |
| 941 | Budelight | 992 | Bulletwood | 3150 | Buoyantly |
| 942 | Budgero | 993 | Bullfaced | 3200 | Buoyrope |
| 943 | Budgy | 994 | Bullfight | 3250 | Buphaga |
| 944 | Budlet | 995 | Bullfinch | 3300 | Burac |
| 945 | Buffalo | 996 | Bullflee | 3350 | Burbot |
| 946 | Buffcoats | 997 | Bullfly | 3400 | Burdelais |
| 947 | Buffer | 998 | Bullfrog | 3450 | Burdener |
| 948 | Bufferhead | 999 | Bullhead | 3500 | Burdensome |
| 949 | Buffets | 1000 | Bullimony | 3550 | Burdock |
| 950 | Buffeting | 1050 | Bullionist | 3600 | Burdon |
| 951 | Buffjerkin | 1100 | Bullirag | 3650 | Bureau |
| 952 | Buffle | 1150 | Bullish | 3700 | Bureaucra |
| 953 | Buffoon | 1200 | Bullock | 3750 | Burette |
| 954 | Buffoonery | 1250 | Bullseye | 3800 | Burgall |
| 955 | Buffoonish | 1300 | Bullstag | 3850 | Burgess |
| 956 | Buffstick | 1350 | Bulltrout | 3900 | Burghal |
| 957 | Buffycoat | 1400 | Bullwort | 3950 | Burghbote |
| 958 | Buffymite | 1450 | Bully | 4000 | Burghist |
| 959 | Bugaboo | 1500 | Bullying | 4050 | Burgholder |
| 960 | Bugbear | 1550 | Bulrush | 4100 | Burglarist |
| 961 | Buggy | 1600 | Bulse | 4150 | Burglary |
| 962 | Bugle | 1650 | Bulwark | 4200 | Burgmaster |
| 963 | Buglehorn | 1700 | Bumbaliff | 4250 | Burgmot |
| 964 | Bugleweed | 1750 | Bumble | 4300 | Burgoo |
| 965 | Bugloss | 1800 | Bumblebee | 4350 | Burgrave |
| 966 | Bugwort | 1850 | Bumboat | 4400 | Burgundy |
| 967 | Buhlwork | 1900 | Bumelia | 4450 | Burgward |
| 968 | Buhrstone | 1950 | Bump | 4500 | Burial |
| 969 | Builder | 2000 | Bumper | 4550 | Burin |
| 970 | Building | 2050 | Bumpkinly | 4600 | Burker |
| 971 | Built | 2100 | Bumptious | 4650 | Burkism |
| 972 | Bukschish | 2150 | Bunchiness | 4700 | Burlace |

## Quantities (*Continued*)

| | Code | | Code | | Code |
|---|---|---|---|---|---|
| 4750 | Burlap | 6250 | Bushmetal | 7700 | Butwink |
| 4800 | Burlesque | 6300 | Bushquail | 7750 | Butyrine |
| 4850 | Burlet | 6350 | Busily | 7800 | Buxom |
| 4900 | Burletta | 6400 | Business | 7850 | Buxomly |
| 4950 | Burliness | 6450 | Busk | 7900 | Buyer |
| 5000 | Burly | 6500 | Busket | 7950 | Buzz |
| 5050 | Burnable | 6550 | Buskin | 8000 | Buzzard |
| 5100 | Burnetrose | 6600 | Buskman | 8050 | Buzzing |
| 5150 | Burning | 6650 | Bustamite | 8100 | Byblow |
| 5200 | Burnisher | 6700 | Bustle | 8150 | Bycorner |
| 5250 | Burnishing | 6750 | Busts | 8200 | Byend |
| 5300 | Burnt | 6800 | Busy | 8250 | Bygone |
| 5350 | Burr | 6850 | Busybody | 8300 | Bylander |
| 5400 | Burrage | 6900 | Butchery | 8350 | Bylaw |
| 5450 | Burrel | 6950 | Butend | 8400 | Byname |
| 5500 | Burrelfly | 7000 | Butleress | 8450 | Bypath |
| 5550 | Burrock | 7050 | Butment | 8500 | Byplot |
| 5600 | Burrow | 7100 | Butshaft | 8550 | Byre |
| 5650 | Burrowing | 7150 | Butt | 8600 | Byroad |
| 5700 | Burrpod | 7200 | Buttercup | 8650 | Byroom |
| 5750 | Bursary | 7250 | Butterfly | 8700 | Byspell |
| 5800 | Burse | 7300 | Buttermilk | 8750 | Byssine |
| 5850 | Burton | 7350 | Buttery | 8800 | Byssus |
| 5900 | Burtonale | 7400 | Butthinge | 8850 | Bystreet |
| 5950 | Burying | 7450 | Butting | 8900 | Byview |
| 6000 | Bushbok | 7500 | Buttock | 8950 | Bywalk |
| 6050 | Busheller | 7550 | Button | 9900 | Byway |
| 6100 | Bushet | 7600 | Buttonhole | 9950 | Bywipe |
| 6150 | Bushing | 7650 | Buttress | 10000 | Byword |
| 6200 | Bushman | | | | |

### Example

Ship by express ten dozen three-sixteenths inch Straight Shank Drills, list number one hundred eight. **Code Words:** Ash, Battable, Absorb, Labium.

### When Ordering Always Use This Form

1st. How to be shipped..........see pages 202-203
2nd. Quantity..................see pages 207-213
3rd. Diameter or Size...........see pages 215-219
4th. List Number..............see Index
Table of Dates..............see page 206
Prices....................see page 205

# Code—Fractional Sizes

| Size | Code | Size | Code | Size | Code |
|---|---|---|---|---|---|
| 1/64 | Abram | 55/64 | Addison | 1 45/64 | Ageable |
| 1/32 | Abreast | 7/8 | Addition | 1 23/32 | Aged |
| 3/64 | Abridge | 57/64 | Addle | 1 47/64 | Agedly |
| 1/16 | Abroach | 29/32 | Address | 1 3/4 | Ageless |
| 5/64 | Abrupt | 59/64 | Adena | 1 49/64 | Aghast |
| 3/32 | Absalom | 15/16 | Adequate | 1 25/32 | Agile |
| 7/64 | Absentee | 61/64 | Adhere | 1 51/64 | Agility |
| 1/8 | Absolute | 31/32 | Adhesion | 1 13/16 | Agincour |
| 9/64 | Absolution | 63/64 | Adieu | 1 53/64 | Agist |
| 5/32 | Absolve | 1" | Adjacent | 1 27/32 | Agitate |
| 11/64 | Absonant | 1 1/64 | Adjoin | 1 55/64 | Aglow |
| 3/16 | Absorb | 1 1/32 | Adjudge | 1 7/8 | Agnes |
| 13/64 | Absorbent | 1 3/64 | Adjutant | 1 57/64 | Agog |
| 7/32 | Abstain | 1 1/16 | Administer | 1 29/32 | Agonist |
| 15/64 | Abstina | 1 5/64 | Admirable | 1 59/64 | Agony |
| 1/4 | Abstraction | 1 3/32 | Admiral | 1 15/16 | Agrippa |
| 17/64 | Abstruse | 1 7/64 | Admiration | 1 61/64 | Ague |
| 9/32 | Absurd | 1 1/8 | Admire | 1 31/32 | Aguish |
| 19/64 | Abubeker | 1 9/64 | Adobe | 1 63/64 | Ahishar |
| 5/16 | Abugero | 1 5/32 | Adolph | 2" | Ahoy |
| 21/64 | Abukir | 1 11/64 | Adolphus | 2 1/64 | Ailment |
| 11/32 | Abuse | 1 3/16 | Adoniram | 2 1/32 | Aim |
| 23/64 | Abusive | 1 13/64 | Adorn | 2 3/64 | Aimless |
| 3/8 | Abut | 1 7/32 | Adria | 2 1/16 | Airgun |
| 25/64 | Abutment | 1 15/64 | Adriana | 2 5/64 | Airhole |
| 13/32 | Abyss | 1 1/4 | Adrift | 2 3/32 | Airpump |
| 27/64 | Academy | 1 17/64 | Adult | 2 7/64 | Airship |
| 7/16 | Acadia | 1 9/32 | Adultery | 2 1/8 | Airy |
| 29/64 | Accent | 1 19/64 | Advent | 2 9/64 | Aix |
| 15/32 | Accord | 1 5/16 | Adverb | 2 5/32 | Ajar |
| 31/64 | Accordant | 1 21/64 | Adverse | 2 11/64 | Ajuga |
| 1/2 | Accost | 1 11/32 | Afar | 2 3/16 | Akerman |
| 33/64 | Accurse | 1 23/64 | Affable | 2 13/64 | Akin |
| 17/32 | Accustom | 1 3/8 | Affair | 2 7/32 | Alabaster |
| 35/64 | Ache | 1 25/64 | Affector | 2 15/64 | Aladdin |
| 9/16 | Aching | 1 13/32 | Affiant | 2 1/4 | Alameda |
| 37/64 | Acorn | 1 27/64 | Affiliate | 2 17/64 | Alamo |
| 19/32 | Acoustics | 1 7/16 | Affinity | 2 9/32 | Alarum |
| 39/64 | Acquaint | 1 29/64 | Affirm | 2 19/64 | Alas |
| 5/8 | Acquire | 1 15/32 | Affix | 2 5/16 | Alba |
| 41/64 | Acquisition | 1 31/64 | Afflict | 2 21/64 | Albatross |
| 21/32 | Acquit | 1 1/2 | Affluent | 2 11/32 | Albemarle |
| 43/64 | Actress | 1 33/64 | Afflux | 2 23/64 | Albert |
| 11/16 | Actuary | 1 17/32 | Afford | 2 3/8 | Albinism |
| 45/64 | Actuate | 1 35/64 | Affray | 2 25/64 | Albino |
| 23/32 | Acumen | 1 9/16 | Affright | 2 13/32 | Albumen |
| 47/64 | Acute | 1 37/64 | Affront | 2 27/64 | Alcalde |
| 3/4 | Ada | 1 19/32 | Affusion | 2 7/16 | Alcohol |
| 49/64 | Adage | 1 39/64 | Affy | 2 29/64 | Alcove |
| 25/32 | Adair | 1 5/8 | Afraid | 2 15/32 | Alderman |
| 51/64 | Adam | 1 41/64 | Afresh | 2 31/64 | Aldine |
| 13/16 | Adapt | 1 21/32 | African | 2 1/2 | Aldrich |
| 53/64 | Adder | 1 43/64 | Agate | 2 33/64 | Alehouse |
| 27/32 | Addict | 1 11/16 | Agatha | 2 17/32 | Aleppo |

## Code—Fractional Sizes (*Continued*)

| Size | Code | Size | Code | Size | Code |
|---|---|---|---|---|---|
| $2\frac{35}{64}$ | Alert | $3\frac{13}{32}$ | Aluminum | $4\frac{23}{32}$ | Andaman |
| $2\frac{9}{16}$ | Alexander | $3\frac{7}{16}$ | Amadeus | $4\frac{3}{4}$ | Andover |
| $2\frac{37}{64}$ | Alexis | $3\frac{15}{32}$ | Amalekite | $4\frac{25}{32}$ | Andrew |
| $2\frac{19}{32}$ | Alfonso | $3\frac{1}{2}$ | Amalgam | $4\frac{13}{16}$ | Aneurism |
| $2\frac{39}{64}$ | Alfred | $3\frac{17}{32}$ | Amass | $4\frac{27}{32}$ | Angelica |
| $2\frac{5}{8}$ | Alga | $3\frac{9}{16}$ | Amatory | $4\frac{7}{8}$ | Angelo |
| $2\frac{41}{64}$ | Algebra | $3\frac{19}{32}$ | Amazon | $4\frac{29}{32}$ | Angelus |
| $2\frac{21}{32}$ | Algeria | $3\frac{5}{8}$ | Amberger | $4\frac{15}{16}$ | Anger |
| $2\frac{43}{64}$ | Algerine | $3\frac{21}{32}$ | Ambush | $4\frac{31}{32}$ | Angle |
| $2\frac{11}{16}$ | Algiers | $3\frac{11}{16}$ | Amen | 5″ | Anglican |
| $2\frac{45}{64}$ | Alhama | $3\frac{23}{32}$ | American | $5\frac{1}{32}$ | Anglice |
| $2\frac{23}{32}$ | Alhambra | $3\frac{3}{4}$ | Amherst | $5\frac{1}{16}$ | Anglify |
| $2\frac{47}{64}$ | Alibi | $3\frac{25}{32}$ | Amien | $5\frac{3}{32}$ | Anglo |
| $2\frac{3}{4}$ | Alice | $3\frac{13}{16}$ | Amiss | $5\frac{1}{8}$ | Angola |
| $2\frac{49}{64}$ | Alien | $3\frac{27}{32}$ | Amma | $5\frac{5}{32}$ | Angor |
| $2\frac{25}{32}$ | Alight | $3\frac{7}{8}$ | Ammonite | $5\frac{3}{16}$ | Angostura |
| $2\frac{51}{64}$ | Alimony | $3\frac{29}{32}$ | Amorist | $5\frac{7}{32}$ | Angrily |
| $2\frac{13}{16}$ | Alkali | $3\frac{15}{16}$ | Amorphos | $5\frac{1}{4}$ | Anguish |
| $2\frac{53}{64}$ | Allah | $3\frac{31}{32}$ | Amoskeag | $5\frac{9}{32}$ | Angular |
| $2\frac{27}{32}$ | Allegation | 4″ | Ample | $5\frac{5}{16}$ | Angulatior |
| $2\frac{55}{64}$ | Allege | $4\frac{1}{32}$ | Amplify | $5\frac{11}{32}$ | Angulose |
| $2\frac{7}{8}$ | Allegheny | $4\frac{1}{16}$ | Amputate | $5\frac{3}{8}$ | Angust |
| $2\frac{57}{64}$ | Allegro | $4\frac{3}{32}$ | Amuck | $5\frac{13}{32}$ | Angustate |
| $2\frac{29}{32}$ | Allen | $4\frac{1}{8}$ | Amulet | $5\frac{7}{16}$ | Anile |
| $2\frac{59}{64}$ | Alleviate | $4\frac{5}{32}$ | Amuse | $5\frac{15}{32}$ | Aniline |
| $2\frac{15}{16}$ | Alliance | $4\frac{3}{16}$ | Anabasis | $5\frac{1}{2}$ | Animal |
| $2\frac{61}{64}$ | Allot | $4\frac{7}{32}$ | Anaconda | $5\frac{17}{32}$ | Animate |
| $2\frac{31}{32}$ | Alloyed | $4\frac{1}{4}$ | Anadem | $5\frac{9}{16}$ | Animist |
| $2\frac{63}{64}$ | Allude | $4\frac{9}{32}$ | Anaglyph | $5\frac{19}{32}$ | Animous |
| 3″ | Allure | $4\frac{5}{16}$ | Anagram | $5\frac{5}{8}$ | Anisic |
| $3\frac{1}{32}$ | Almaden | $4\frac{11}{32}$ | Anagraph | $5\frac{21}{32}$ | Ankered |
| $3\frac{1}{16}$ | Almon | $4\frac{3}{8}$ | Analogist | $5\frac{11}{16}$ | Ankler |
| $3\frac{3}{32}$ | Almorah | $4\frac{13}{32}$ | Analogy | $5\frac{23}{32}$ | Annalize |
| $3\frac{1}{8}$ | Aloe | $4\frac{7}{16}$ | Anapest | $5\frac{3}{4}$ | Anneloid |
| $3\frac{5}{32}$ | Aloof | $4\frac{15}{32}$ | Anaphora | $5\frac{25}{32}$ | Annex |
| $3\frac{3}{16}$ | Alp | $4\frac{1}{2}$ | Anarchy | $5\frac{13}{16}$ | Annotate |
| $3\frac{7}{32}$ | Alpen | $4\frac{17}{32}$ | Anathema | $5\frac{27}{32}$ | Anode |
| $3\frac{1}{4}$ | Alphabet | $4\frac{9}{16}$ | Anatomist | $5\frac{7}{8}$ | Anodyne |
| $3\frac{9}{32}$ | Alsace | $4\frac{19}{32}$ | Anatomy | $5\frac{29}{32}$ | Anopla |
| $3\frac{5}{16}$ | Altenburg | $4\frac{5}{8}$ | Ancestor | $5\frac{15}{16}$ | Anseres |
| $3\frac{11}{32}$ | Alto | $4\frac{21}{32}$ | Ancient | $5\frac{31}{32}$ | Antacid |
| $3\frac{3}{8}$ | Altorf | $4\frac{11}{16}$ | Ancona | 6″ | Antagonist |

## Code—Millimeter Sizes

| Size | Code | Size | Code | Size | Code |
|---|---|---|---|---|---|
| .5 | Abranchia | .9 | Abregest | 1.3 | Abridgers |
| .6 | Abratery | 1. | Abreption | 1.4 | Abrifle |
| .7 | Abrave | 1.1 | Abrevey | 1.5 | Abrime |
| .75 | Abrawn | 1.2 | Abridged | 1.6 | Abroaches |
| .8 | Abraxito | 1.25 | Abridgedly | 1.7 | Abrogable |

## Code—Millimeter Sizes (*Continued*)

| Size | Code | Size | Code | Size | Code |
|---|---|---|---|---|---|
| 1.75 | Abrogated | 6.2 | Abstorted | 13. | Accumbent |
| 1.8 | Abroma | 6.25 | Abstractax | 13.5 | Acetal |
| 1.9 | Abrooding | 6.3 | Abstracted | 14. | Acheron |
| 2. | Abruption | 6.4 | Abstractly | 14.5 | Acmite |
| 2.1 | Abrural | 6.5 | Abstratum | 15. | Acouchy |
| 2.2 | Abrus | 6.6 | Abstrila | 15.5 | Acquiesce |
| 2.25 | Abrusant | 6.7 | Abstrop | 16. | Acquiring |
| 2.3 | Abrustate | 6.75 | Abstrusect | 16.5 | Acquisitor |
| 2.4 | Abscess | 6.8 | Abstrusity | 17. | Acrostic |
| 2.5 | Abscission | 6.9 | Absuatum | 17.5 | Actuaryte |
| 2.6 | Absconder | 7. | Absume | 18. | Aculeons |
| 2.7 | Absent | 7.1 | Absuper | 18.5 | Acuminate |
| 2.75 | Absentax | 7.2 | Absurdity | 19. | Acutely |
| 2.8 | Absintat | 7.25 | Absurdive | 19.5 | Adagio |
| 2.9 | Absippo | 7.3 | Absurdly | 20. | Adalid |
| 3. | Absisting | 7.4 | Absuress | 20.5 | Adamite |
| 3.1 | Absolo | 7.5 | Abtisco | 21. | Addendum |
| 3.2 | Absolutely | 7.6 | Abubus | 21.5 | Addicted |
| 3.25 | Absolutelz | 7.7 | Abudena | 22. | Additament |
| 3.3 | Absolutepo | 7.75 | Abudous | 22.5 | Additory |
| 3.4 | Absolutest | 7.8 | Abuffa | 23. | Addlings |
| 3.5 | Absolutid | 7.9 | Abugas | 23.5 | Adenoid |
| 3.6 | Absolutist | 8. | Abugetry | 24. | Adequately |
| 3.7 | Absolutory | 8.1 | Abugmot | 24.5 | Adherent |
| 3.75 | Absolux | 8.2 | Abugtela | 25. | Adhibit |
| 3.8 | Absolvabum | 8.25 | Abuhont | 25.5 | Adject |
| 3.9 | Absolvata | 8.3 | Abuitum | 26. | Adjoining |
| 4. | Absolvers | 8.4 | Abula | 26.5 | Adjunct |
| 4.1 | Absomex | 8.5 | Abundance | 27. | Adminos |
| 4.2 | Absomites | 8.6 | Aburius | 27.5 | Admirabunt |
| 4.25 | Absomust | 8.7 | Abusage | 28. | Admiralty |
| 4.3 | Absona | 8.75 | Abused | 28.5 | Admirata |
| 4.4 | Absonous | 8.8 | Abuseful | 29. | Adolescent |
| 4.5 | Absonoyed | 8.9 | Abusers | 29.5 | Adolphead |
| 4.6 | Absoplay | 9. | Abusing | 30. | Adonic |
| 4.7 | Absorat | 9.1 | Abusita | 30.5 | Adoptive |
| 4.75 | Absorately | 9.2 | Abusively | 31. | Adrialt |
| 4.8 | Absorbable | 9.25 | Abusivous | 31.5 | Adrianus |
| 4.9 | Absorbalo | 9.3 | Abusocus | 32. | Adscript |
| 5. | Absorbasta | 9.4 | Abusy | 32.5 | Adulterant |
| 5.1 | Absorbefo | 9.5 | Abusydos | 33. | Adventist |
| 5.2 | Absornat | 9.6 | Abutably | 33.5 | Adverbial |
| 5.25 | Absoroster | 9.7 | Abutely | 34. | Advocate |
| 5.3 | Absorpt | 9.75 | Abutent | 34.5 | Affa |
| 5.4 | Absorptive | 9.8 | Abuthal | 35. | Affecting |
| 5.5 | Abstaffo | 9.9 | Abutmenes | 35.5 | Afferent |
| 5.6 | Abstemious | 10. | Abuttal | 36. | Affiche |
| 5.7 | Absterge | 10.5 | Acacy | 36.5 | Affinage |
| 5.75 | Abstergely | 11. | Acadera | 37. | Affirmer |
| 5.8 | Absterse |  |  | 37.5 | Afflatus |
| 5.9 | Abstersion | 11.5 | Acarus | 38. | Affluency |
| 6. | Abstinent | 12. | Accordable | 38.5 | Afforage |
| 6.1 | Abstirbo | 12.5 | According | 39. | Afforest |

## Code—Millimeter Sizes (*Continued*)

| Size | Code | Size | Code | Size | Code |
|---|---|---|---|---|---|
| 39.5 | Affret | 52. | Airborn | 64.5 | Aleman |
| 40. | Affrighter | 52.5 | Airhill | 65. | Aleroom |
| 40.5 | Affusible | 53. | Airling | 65.5 | Aless |
| 41. | Afloat | 53.5 | Airshot | 66. | Alfoy |
| 41.5 | Afreet | 54. | Aisled | 66.5 | Alfster |
| 42. | Afric | 54.5 | Ajack | 67. | Algaman |
| 42.5 | Agatesci | 55. | Ajarax | 67.5 | Algerilial |
| 43. | Agathy | 55.5 | Ajuging | 68. | Algerless |
| 43.5 | Agect | 56. | Akletta | 68.5 | Alhall |
| 44. | Agedena | 56.5 | Alacade | 69. | Alhambert |
| 44.5 | Agency | 57. | Alalite | 69.5 | Alibone |
| 45. | Agidae | 57.5 | Alamine | 70. | Aliding |
| 45.5 | Agileness | 58. | Alary | 70.5 | Alienate |
| 46. | Agin | 58.5 | Alaster | 71. | Aligned |
| 46.5 | Agistment | 59. | Albanian | 71.5 | Alkaline |
| 47. | Aglaia | 59.5 | Albed | 72. | Allegate |
| 47.5 | Agnate | 60. | Albescent | 72.5 | Allegating |
| 48. | Agnomen | 60.5 | Albinister | 73. | Allegged |
| 48.5 | Agonize | 61. | Alborak | 73.5 | Allegrotes |
| 49. | Agrarian | 61.5 | Alcat | 74. | Allenting |
| 49.5 | Aground | 62. | Alcoran | 74.5 | Alleyed |
| 50. | Aguetree | 62.5 | Alder | 75. | Alloper |
| 50.5 | Ahold | 63. | Aldermanic | 75.5 | Alloying |
| 51. | Aikraw | 63.5 | Aldoon | 76. | Allumen |
| 51.5 | Ailure | 64. | Aleak | | |

## Code—Number Sizes

| Size | Code | Size | Code | Size | Code |
|---|---|---|---|---|---|
| 7/0 | Abstricted | 16 | Absonoy | 38 | Abscondent |
| 6/0 | Abstrahent | 17 | Absonatus | 39 | Abscond |
| 5/0 | Abstractor | 18 | Absonage | 40 | Abscisses |
| 4/0 | Abstractive | 19 | Absomul | 41 | Abscind |
| 3/0 | Abstoady | 20 | Absomalia | 42 | Abrye |
| 2/0 | Abstivial | 21 | Absolvitor | 43 | Abrusor |
| 0 | Abstides | 22 | Absolved | 44 | Abruro |
| 1 | Abstergent | 23 | Absolvax | 45 | Abruptness |
| 2 | Abstention | 24 | Absolvasti | 46 | Abruptly |
| 3 | Abstade | 25 | Absolvabo | 47 | Abrupting |
| 4 | Absorption | 26 | Absolutus | 48 | Abrooks |
| 5 | Absoros | 27 | Absolutiva | 49 | Abrood |
| 6 | Absorbing | 28 | Absolutigo | 50 | Abrogation |
| 7 | Absorbegg | 29 | Absolutex | 51 | Abrogate |
| 8 | Absorbed | 30 | Absolutem | 52 | Abroad |
| 9 | Absorbarl | 31 | Absitum | 53 | Abrital |
| 10 | Absorbams | 32 | Absist | 54 | Abrief |
| 11 | Absorbak | 33 | Absinthis | 55 | Abridgment |
| 12 | Absorbagum | 34 | Absinthian | 56 | Abricock |
| 13 | Absoquil | 35 | Absenters | 57 | Abreuvoir |
| 14 | Absopris | 36 | Absentator | 58 | Abretail |
| 15 | Absonult | 37 | Absence | 59 | Abresto |

## Code—Number Sizes (*Continued*)

| Size | Code | Size | Code | Size | Code |
|---|---|---|---|---|---|
| 60 | Abrequest | 67 | Abray | 74 | Abrater |
| 61 | Abrenoy | 68 | Abraxas | 75 | Abrasion |
| 62 | Abrenowt | 69 | Abravos | 76 | Abrase |
| 63 | Abrenounce | 70 | Abraviat | 77 | Abranch |
| 64 | Abreheal | 71 | Abraumery | 78 | Abraid |
| 65 | Abreddy | 72 | Abraumed | 79 | Abrahamman |
| 66 | Abreasute | 73 | Abraum | 80 | Abrahamic |

## Code—Letter Sizes

| Size | Code | Size | Code | Size | Code |
|---|---|---|---|---|---|
| 4/A | Abstainer | H | Abstrusely | R | Abusable |
| 3/A | Abstentious | I | Absuit | S | Abusena |
| 2/A | Abster | J | Absumption | T | Abusingly |
| A | Abstersiv | K | Absurata | U | Abusual |
| B | Abstir | L | Absurdness | V | Abutable |
| C | Abstorso | M | Abtalma | W | Abutilon |
| D | Abstract | N | Abudding | X | Abvolate |
| E | Abstracters | O | Abugler | Y | Aby |
| F | Abstrego | P | Abuhata | Z | Abyssal |
| G | Abstringe | Q | Abulites | | |

## Code—Miscellaneous Sizes

| Size | Code | Size | Code | Size | Code |
|---|---|---|---|---|---|
| 0 to 1 | Arabel | 4 to 2 | Areolar | 9 to 10 | Arista |
| 1 “ 1 | Arcade | 4 “ 3 | Areopagus | 9A | Aristocrat |
| 1 “ 2 | Arcanum | 4 “ 4 | Argal | 9B | Arithmetic |
| 1 “ 3 | Arch | 4 “ 5 | Argentine | 9C | Armadillo |
| 1 “ 4 | Archaic | 4 “ 6 | Argillous | A1 | Arsavine |
| 1 “ 5 | Archangel | 5 “ 3 | Argonaut | C2 | Arsenetted |
| 2 “ 1 | Archness | 5 “ 4 | Argosy | D1 | Arseniasis |
| 2 “ 2 | Arcograph | 5 “ 5 | Argue | E1 | Arsenicate |
| 2 “ 3 | Arctic | 5 “ 6 | Argument | E2 | Arsenide |
| 2 “ 4 | Arcuate | 5 “ 7 | Argumental | F1 | Arsenillo |
| 2 “ 5 | Arcular | 6 “ 7½ | Ariactine | F2 | Arsenism |
| 3 “ 1 | Ardent | 7 “ 8 | Ariadant | J1 | Arshine |
| 3 “ 2 | Ardor | 7A | Ariadne | J2 | Arsis |
| 3 “ 3 | Arduous | 7B | Aridity | M1 | Arstable |
| 3 “ 4 | Area | 8 “ 9 | Aridness | M2 | Artarine |
| 3 “ 5 | Areaway | 8A | Aright | N1 | Arterial |
| 3 “ 6 | Arena | 8B | Arisen | N2 | Artery |

# Tables and General Information

Adjustable Reamers.........See Index Page 225
Alphabetical Index.........221
CLE-FORGE DRILLS—The World's Record Drills.........12-17
"Cleveland" High Speed Adjustable Reamers.........118-127
"Cleveland" High Speed Spot Facers.........144-149
Counterbore Sizes for Cap and Machine Screws.........149
Cutting Speeds and Feeds.........186-188
Decimal Equivalents of Regular Sizes.........194-198
Diagram—Patent Sockets with Drift Inserted.........9
Dimensions of Regular Taper Shank.........6
Dimensions of Regular Taper Holes.........189
Drilling Helps and Hints.........176-178
Drilling Speeds and Feeds.........179-183
Ezy-Out Screw Extractors.........140-143
Fractional Sizes with Millimeter Equivalents.........199-200
General Instructions and Dates with Code Words.........202-219
Index by List Numbers with Code Words.........230-240
"Little Doctor, The".........185
Numerical Index.........230-240
"Paradox" Adjustable Reamers.........130-136
"Peerless" High Speed Reamers.........98-115
Pipe Taps.........193
Private Code.........202-219
Selecting a Reamer.........64-65
Shop Helps.........184
Special Drills.........46
Special Reamers.........137-138
Suggestions for Ordering Special Drills and Reamers.........174, 175
Tap Drill Sizes.........190-192
Tapers.........6, 189
Taper Locomotive Reamers.........85

# Alphabetical Index

| List No. | Description | Page |
|---|---|---|
| | **Arbors** | |
| 133 | Straight Shank.................... | 81, 124 |
| 133A | Taper Shank.................... | 81, 124 |
| 335 | Patent Arbor for "Paradox" Shell Reamers—Straight Shank.................... | 133 |
| 336 | Patent Arbor for "Paradox" Shell Reamers—Taper Shank.................... | 133 |
| 532 | "Peerless" Shell Reamer—Straight Shank. | 112 |
| 533 | "Peerless" Shell Reamer—Taper Shank... | 112 |
| 535 | "Peerless" Expansion Shell Reamer—Straight Shank.................... | 113 |
| 536 | "Peerless" Expansion Shell Reamer—Taper Shank.................... | 113 |
| 78 | Patent Arbor—Straight Shank.......... | 80 |
| 79 | Patent Arbor—Taper Shank.......... | 80 |
| 196 | Patent Arbor for Shell End Mills—B. & S. Shank.................... | 163 |
| | **Bits—Carbon and High Speed** | |
| 114E | Bell Hangers' and Electricians'.......... | 40 |
| 123 | Bobbin.................... | 31 |
| 122 | Machine—Straight Shank.......... | 43 |
| 122A | Machine—Shank ½ by 2½ inches........ | 42 |
| 169 | Machine—Shank ½ by 2 inches.......... | 43 |
| 122B | Machine—Taper Shank.......... | 42 |
| 114A | Wood—For Brace.................... | 40 |
| 13A & B | Wood—Sets.................... | 54, 56 |
| 958 | Bobbin, High Speed.................... | 31 |
| | **Cabinets** | |
| 07 and 04 | For Straight and Taper Shank Drills...... | 57–58 |
| 06 | Drill Drawers—Sectional.......... | 58 |
| 890 | **Centers, Lathe**.................... | 152 |
| | **Chucks** (See Sockets) | |
| | **Counterbores—Carbon and High Speed** | |
| 176 & 876 | Straight Shank—with Interchangeable Pilots.................... | 150 |
| 879 | Straight Shank—Spot Facers—with Interchangeable Pilots.................... | 147, 148 |
| 177 & 877 | Taper Shank—with Interchangeable Pilots | 151 |
| 878 | Taper Shank — Spot Facers — with Interchangeable Pilots.................... | 145, 146 |
| | Counterbore Sizes for Cap Screws and Machine Screws.................... | 149 |
| | **Countersinks—Carbon and High Speed** | |
| 96 | Bell Type Countersinks.................... | 59 |
| 98 | Drills and Countersinks Combined........ | 59 |
| 19 | Drills and Countersinks Combined—Sets.. | 60 |

## Alphabetical Index (*Continued*)

| List No. | Description | Page |
|---|---|---|
| | **Countersinks—Carbon and High Speed** (*Continued*) | |
| 996 | Bell Type Countersinks—High Speed | 59 |
| 998 | Drills and Countersinks Combined—High Speed | 59 |
| 49 | Drills and Countersinks Combined—High Speed Sets | 60 |
| 115A | Machine | 61 |
| 125A | **Center Reamers** | 61 |
| 610 | **Center Reamers—High Speed** | 61 |
| 105 | **Drifts** | 9 |
| | **Drills—Carbon Steel** | |
| 114 | Bit Stock | 39 |
| 13 & 14B | Bit Stock—Sets in Boxes | 55, 56 |
| 116 | Blacksmiths'—Shanks 5/8 inch diameter | 34 |
| 118 | Blacksmiths'—1/2 inch Shank—Long Set | 35 |
| 120 | Blacksmiths'—1/2 inch Shank—Short Set | 33 |
| 95 | Bonding | 38 |
| 1208 | Brass, Short Set—Fraction Sizes | 31 |
| 1207 | Brass, Short Set—Wire Gauge Sizes | 31 |
| 125 | Center | 37 |
| 113 | Coopers' Dowel | 41 |
| 98 | Drills and Countersinks Combined | 59 |
| | Dual Cut Drills | 32 |
| 21 | Four-Fluted—Taper Shank | 24 |
| 25 | Four-Fluted—Straight Shank | 25 |
| 1308 | "Hy-Spiral" Type Drill | 30 |
| 10 | Jewelers' Set | 56 |
| 99A | Oil Hole—Straight Shank | 45 |
| 91A | Oil Hole—Taper Shank | 45 |
| 99 | Oil Tube—Straight Shank | 45 |
| 91 | Oil Tube—Taper Shank | 45 |
| 111 | Ratchet—Square Taper Shank | 36 |
| | Sets, Drills | 47–56 |
| 160 | Straight Fluted — Straight Shank — Long Set | 44 |
| 145 | Straight Fluted — Straight Shank — Short Set | 44 |
| 166 | Straight Fluted — Straight Shank — Wire Gauge | 44 |
| 147 | Straight Fluted—Taper Shank | 44 |
| 110 | Straight Shank—Long Set | 20, 21 |
| 108 | Straight Shank—Short Set | 27 |
| 1208 | Straight Shank—Short Set—For Brass | 31 |
| 108A | Straight Shank—Wire Gauge | 28, 29 |
| 1207 | Straight Shank—Wire Gauge—For Brass | 31 |
| 109 | Straight Shank—Letter Sizes | 29 |
| 113A | Straight Shank—Wood | 41 |
| 106 | Taper Shank | 18, 19 |

## Alphabetical Index (*Continued*)

**Drills—Carbon Steel (*Continued*)**

| List No. | Description | Page |
|---|---|---|
| 112 | Tell-Tale | 37 |
| 112A | Tell-Tale, Long Set | 37 |
| 24 | Three-Fluted—Straight Shank | 25 |
| 12 | Three-Fluted—Taper Shank | 24 |
| 95 | Track (See Bonding Drills) | 38 |

**Drills—High Speed**

| List No. | Description | Page |
|---|---|---|
| 924 | "Bakelite" Type Drills, Fraction Sizes | 30 |
| 925 | "Bakelite" Type Drills, Wire Gauge Sizes | 30 |
| 931 | Blacksmiths'—5/8 inch Shank | 34 |
| 936 | Blacksmiths'—1/2 inch Shank—Short Set | 33 |
| 944 | Bonding | 38 |
| 998 | Drills and Countersinks Combined | 59 |
| 939 | Four-Fluted—Straight Shank | 25 |
| 938 | Four-Fluted—Taper Shank | 23 |
|  | Dual Cut Drills | 32 |
| 957 | "Hy-Spiral" Type Drills | 30 |
| 929A | Oil Hole—Straight Shank | 45 |
| 926A | Oil Hole—Taper Shank | 45 |
| 929 | Oil Tube—Straight Shank | 45 |
| 926 | Oil Tube—Taper Shank | 45 |
| 914 | Ratchet—Square Taper Shank | 36 |
|  | Sets, Drills | 47–56 |
| 946 | Shell | 26 |
| 950 | Straight Shank—CLE-FORGE | 20, 21 |
| 917 | Straight Shank—Short Set | 27 |
| 919 | Straight Shank—Letter Size | 29 |
| 918 | Straight Shank—Wire Gauge | 28, 29 |
| 940 | Taper Shank—CLE-FORGE | 13–17 |
| 941 | Taper Shank—CLE-FORGE with Shanks Smaller than Regular | 13–17 |
| 942 | Taper Shank—CLE-FORGE with Shanks Larger than Regular | 13–17 |
| 951 | Tell-Tale, Long Set | 37 |
| 952 | Tell-Tale | 37 |
| 953 | Tell-Tale—Three Fluted | 37 |
| 909 | Three-Fluted—Straight Shank | 25 |
| 907 | Three-Fluted—Taper Shank | 23 |
| 948 | Track | 38 |

**Drills—Millimeter Sizes—Carbon and High Speed**

| List No. | Description | Page |
|---|---|---|
| 1153 | Straight Shank—Long Set | 169 |
| 954 | Straight Shank—CLE-FORGE | 169 |
| 1154 & 920 | Straight Shank—Short Set | 170, 171 |
| 943 | Taper Shank—CLE-FORGE | 164–166 |

# Alphabetical Index (*Continued*)

**Drills—Millimeter Sizes—Carbon and High Speed** (*Continued*)

| List No. | Description | Page |
|---|---|---|
| 945 | Taper Shank—CLE-FORGE—Smaller than Regular | 164–166 |
| 1152 | Taper Shank | 167, 168 |
| | **Drills—In Sets** | |
| 13 & 14B | Bit Stock—Sets | 55, 56 |
| 1 to 11 | Miscellaneous—Sets | 56 |
| 18 Set | Straight Shank—Short Set in Package | 53, 56 |
| 22 Set | Straight Shank—Short Set in Package | 53, 56 |
| 26 Set | Straight Shank—Short Set in Round Wooden Container | 50, 56 |
| 260 Carton | Six No. 26 Sets in Display Carton | 50, 56 |
| 50 Set | Straight Shank Drills—Short Set on Metal Stand | 52, 56 |
| 51 Set | Short set straight shank drills $\frac{1}{16}$ to $\frac{1}{2}$ inch by 64ths, mounted on metal stand, in dustproof metal carrying case | 48 |
| 52 Set | Wire gauge drills No. 1 to No. 60, mounted on metal stand, in dustproof metal carrying case | 49 |
| 54 Set | Straight Shank High Speed—Short Set on Metal Stand | 52, 56 |
| 57 Set | Straight Shank High Speed—Short Set in Round Wooden Container | 51, 56 |
| 570 Carton | Six No. 57 Sets in Display Carton | 51, 56 |
| 55 Set | Straight Shank High Speed—Letter Sizes A to Z, on Block | 56 |
| 56 Set | Straight Shank Drills—Short Set in Package | 53, 56 |
| 58 Set | Short set straight shank high speed drills $\frac{1}{16}$ to $\frac{1}{2}$ inch by 64ths, on metal stand, in dustproof metal case | 48 |
| 59 Set | Wire gauge high speed drills No. 1 to No. 60, on metal stand, in dustproof metal case | 49 |
| 60 Set | Straight Shank Drills—Short Set on Metal Stand—Millimeter Sizes | 56 |
| 80 Set | Straight Shank Drills—Wire Gauge on Metal Stand | 52, 56 |
| 84 Set | Straight Shank High Speed—Wire Gauge on Metal Stand | 52, 56 |
| 13A & B | Wood Bits for Brace—Sets | 54, 56 |
| 890 | **Lathe Centers** | 152 |
| 143 | **Mandrels—Hardened and Ground** | 153 |

## Alphabetical Index (*Continued*)

**Mills—Carbon Steel**

| List No. | Description | Page |
|---|---|---|
| 186 | End — Spiral Fluted — Brown & Sharpe Shank | 158 |
| 185 | End—Spiral Fluted—Regular Taper Shank | 157 |
| 184 | End—Straight Shank | 156 |
| 180 | Hollow—Plain—For Brass | 154 |
| 181 | Hollow—Plain—For Steel | 154 |
| 182 | Hollow—Adjustable—For Brass | 155 |
| 183 | Hollow—Adjustable—For Steel | 155 |
| | **Mills—High Speed Steel** | |
| 676 | End — Spiral Fluted — Brown & Sharpe Shank | 158 |
| 677 | End — Spiral Fluted — Coarse Tooth | 159 |
| 675 | End—Spiral Fluted—Regular Taper Shank | 157 |
| 679 | End — Spiral Fluted — B & S Shank — Two Lipped Slotting | 160 |
| 678 | End—Straight Fluted — B & S Shank — Two Lipped Slotting | 160 |
| 681 | End — Spiral Fluted — Straight Shank — Two Lipped Slotting | 161 |
| 680 | End — Straight Fluted — Straight Shank Two Lipped Slotting | 161 |
| 674 | End—Straight Shank | 156 |
| 662 | Hollow—Adjustable—For Brass | 155 |
| 663 | Hollow—Adjustable—For Steel | 155 |
| 660 | Hollow—Plain—For Brass | 154 |
| 661 | Hollow—Plain—For Steel | 154 |
| 671 | Shell End—Spiral Fluted | 162 |
| | **Reamers—Adjustable and Expansion Types—Carbon and High Speed Steel** | |
| 607 | "Cleveland" Chucking—Adjustable—Straight Shank—High Speed | 120 |
| 608 | "Cleveland" Chucking—Adjustable—Taper Shank—High Speed | 119 |
| 606 | "Cleveland" Shell—Adjustable—High Speed | 121, 122 |
| 126 | Expansion—Spiral Fluted | 67 |
| 129 | Expansion—Straight Fluted | 66 |
| | "Paradox" Adjustable—Carbon and High Speed | 130–136 |
| | "Peerless" Expansion—High Speed | 98–115 |
| | "Quick-Set" Adjustable—Carbon and High Speed | 91–94 |

## Alphabetical Index (*Continued*)

**Reamers—Carbon Steel**

| List No. | Description | Page |
|---|---|---|
| 125A | Center | 61 |
| 126 | Hand—Spiral Fluted Expansion | 67 |
| 134 | Chucking—Fluted—Straight Shank | 72 |
| 134A | Chucking—Fluted—Taper Shank | 73, 74 |
| 136 | Chucking—Rose—Straight Shank | 75 |
| 151 | Chucking—Rose—Taper Shank | 76 |
| 126 and 129 | Expansion | 66, 67 |
| 25 | Four-Fluted Reamers or Drills—Straight Shank | 25 |
| 21 | Four-Fluted Reamers or Drills — Taper Shank | 24 |
| 128A | Hand—Without Screw Feed | 68, 69 |
| 128C | Hand—Spiral Fluted | 70 |
| 128B | Jobbers'—Taper Shank | 71 |
| 130A | Shell—Fluted | 77, 78 |
| 130C | Shell—Spiral Fluted | 79 |
| 24 | Three-Fluted Reamers or Drills—Straight Shank | 25 |
| 12 | Three-Fluted Reamers or Drills — Taper Shank | 24 |

**Reamers—Taper—Carbon Steel**

| List No. | Description | Page |
|---|---|---|
| 137A | Bit Stock | 88 |
| 150A | Bridge—Taper Shank—Straight Flute | 82 |
| 232-244 | Burring, Spiral Flute | 89 |
| 154 | Die-Sinking, Spirex | 87 |
| 141 | Locomotive—Square Shank | 84 |
| 157 | Locomotive—Taper Shank | 84 |
| 158 | Locomotive—Taper — 6 Fluted — Square Shank | 84 |
| 159 | Locomotive—Taper — 6 Fluted — Taper Shank | 84 |
| 137 | Taper Pin | 85 |
| 139 | Taper Pin—Spiral Flute | 85 |
| 140 | Taper Pin—"Spirex"—Machine | 86 |
| 142 | Taper—Repairman's | 88 |
| 144 | Socket—Finishing—Straight Shank | 90 |
| 144A | Socket—Roughing—Straight Shank | 90 |
| 144B | Socket—Finishing—Taper Shank | 90 |
| 144C | Socket—Roughing—Taper Shank | 90 |
|  | **Reamers—Special** | 137, 138 |

**Reamers—Millimeter Sizes**

| List No. | Description | Page |
|---|---|---|
| 1196 | Hand—Without Screw Feed | 172 |

## Alphabetical Index (*Continued*)

**Reamers—"Quick-Set"—Adjustable**

| List No. | Description | Page |
|---|---|---|
| 148 | Adjustable | 91–94 |
| | Blades and Nuts | 92 |

**Reamers—"Paradox" Adjustable— Carbon Steel Blades**

| List No. | Description | Page |
|---|---|---|
| 312 | Chucking—Straight Shank | 135 |
| 317 | Chucking—Taper Shank | 136 |
| 306 | Hand | 134 |
| 301 | Shell | 131 |

**Reamers—High Speed**

| List No. | Description | Page |
|---|---|---|
| 613 | Bridge—Taper Shank—Three Flute | 82 |
| 615 | Bridge—Taper Shank—Straight Flute | 82 |
| 616 | Bridge—Taper Shank—Spiral Flute | 82 |
| 617 & 618 | Bridge—Taper Shank, Short Body | 83 |
| 610 | Center | 61 |
| 607 | Chucking—Adjustable—Straight Shank—High Speed | 120 |
| 608 | Chucking—Adjustable—Taper Shank — High Speed | 119 |
| 630 | Chucking—Fluted—Straight Shank | 72 |
| 632 | Chucking—Fluted—Taper Shank | 73, 74 |
| 634 | Chucking—Rose—Straight Shank | 75 |
| 636 | Chucking—Rose—Taper Shank | 76 |
| 654 | Die-Sinking—Spirex—High Speed | 87 |
| 939 | Four-Fluted Reamers or Drills—Straight Shank | 25 |
| 938 | Four-Fluted Reamers or Drills — Taper Shank | 23 |
| 645 | Hand—Spiral Fluted | 70 |
| 624 | Hand—Without Screw Feed | 68, 69 |
| 628 | Jobbers'—Taper Shank | 71 |
| 638 | Locomotive—Square Shank | 84 |
| 640 | Locomotive—Taper Shank | 84 |
| 647 | Locomotive—Taper — 4 Fluted — Square Shank | 84 |
| 648 | Locomotive—Taper — 4 Fluted — Taper Shank | 84 |
| 651 | Locomotive—Taper — 6 Fluted — Square Shank | 84 |
| 652 | Locomotive—Taper — 6 Fluted — Taper Shank | 84 |
| 649 | "Quick-Set"—Adjustable—High Speed | 91, 92 |
| 606 | Shell—Adjustable—High Speed | 121, 122 |
| 620 | Shell—Fluted | 77, 78 |
| 646 | Shell—Spiral Fluted | 79 |

## Alphabetical Index (*Continued*)

**Reamers—High Speed (*Continued*)**

| List No. | Description | Page |
|---|---|---|
| 657 | Taper Pin—Straight Flute | 85 |
| 659 | Taper Pin—Spiral Flute | 85 |
| 650 | Taper Pin—Machine—"Spirex" | 86 |
| 909 | Three-Fluted Reamers or Drills—Straight Shank | 25 |
| 907 | Three-Fluted Reamers or Drills — Taper Shank | 23 |

**Reamers—"Quick-Set" Adjustable—High Speed Blades**

| List No. | Description | Page |
|---|---|---|
| 649 | "Quick-Set" and Blades | 91, 92 |

**Reamers—"Paradox" Adjustable—High Speed Blades**

| List No. | Description | Page |
|---|---|---|
| 603 | Chucking—Straight Shank | 135 |
| 604 | Chucking—Taper Shank | 136 |
| 602 | Hand | 134 |
| 601 | Shell | 131 |

**Reamers—"Peerless" High Speed**

| List No. | Description | Page |
|---|---|---|
| 503 | Chucking—Straight Shank | 101 |
| 515 | Chucking—Taper Shank | 107 |
| 509 | Core—Straight Shank | 105 |
| 517 | Core—Taper Shank | 109 |
| 504 | Expansion Chucking—Straight Shank | 103, 104 |
| 516 | Expansion Chucking—Taper Shank | 108 |
| 510 | Expansion Core—Straight Shank | 106 |
| 518 | Expansion Core—Taper Shank | 110 |
| 502 | Expansion Hand | 100 |
| 520 | Expansion Shell | 114 |
| 501 | Hand | 99 |
| 519 | Shell | 111 |
| 521 | Shell Core | 111 |
| 534 | **Adjusting Wrenches** — (for "Peerless" Expansion Shell Reamers) | 115 |
| 537 | **Adjusting Wrenches** for "Peerless" Reamers—Lists Nos. 504, 510, 516, 518 | 102 |

**Reamers—In Sets**

| List No. | Description | Page |
|---|---|---|
| 42, 44, 45, 46 | Quick-Set Adjustable. In Cases | 93, 94 |
| 27A, B, C, E, F, G and No. 36 Sets | Hand Reamers—In Cases | 95 |
| 32 Set | Socket—In Cases | 95 |
| 30 and 35 Sets | Taper Pin—In Round Boxes | 95 |

## Alphabetical Index (*Continued*)

### Screw Extractors

| List No. | Description | Page |
|---|---|---|
| 192 | "Ezy-Out" Screw Extractors | 141 |
| 15, 15A, 16, 17 & 20 Sets | "Ezy-Out" Screw Extractors | 142, 143 |

### Sockets and Sleeves

| | | |
|---|---|---|
| 102 | Fitted | 7 |
| 100 | Rough | 7 |
| 103 | Screw Machine | 8 |
| 104 | Shell, or Sleeve | 8 |

### Spot Facers—High Speed

| | | |
|---|---|---|
| **879** | Straight Shank — Short Set — With Interchangeable Pilots | **147, 148** |
| **878** | Taper Shank — Short Set — With Interchangeable Pilots | **145, 146** |
| 534 | **Wrenches** — (For "Peerless" Expansion Shell Reamers) | 115 |
| 537 | **Wrenches, Adjusting** — (For "Peerless" Expansion Reamers, Lists Nos. 504, 510, 516, 518 | 102 |

# Numerical Index with Code Words

**Tools in Sets**

| List No. | | Description | Code Word | Page No. |
|---|---|---|---|---|
| 1 | Set | Taper Shank Drills, ¼ to 1 inch by 16ths.................... | Parboil | 56 |
| 2 | “ | Taper Shank Drills, ⅜ to 1¼ inch by 16ths.................... | Parbreak | 56 |
| 3 | “ | Taper Shank Drills, ⅜ to ¾ inch by 32nds, $\frac{13}{16}$ to 1¼ inch by 16ths..................... | Parch | 56 |
| 5 | “ | Short Set Straight Shank Drills, $\frac{1}{16}$ to ½ inch by 64ths, mounted | Parchment | 56 |
| 6 | “ | Short Set Straight Shank Drills, $\frac{1}{16}$ to ½ inch by 32nds, mounted | Parcity | 56 |
| 7 | “ | Wire Gauge Drills, No. 1 to No. 60, Short Set S. S. Drills, ¼ to ⅜ inch by 32nds, mounted.... | Pardon | 56 |
| 8 | “ | Wire Gauge Drills, No. 1 to No. 60, mounted................. | Parental | 56 |
| 9 | “ | Wire Gauge Drills, Alternate Nos. from 1 to 59, mounted........ | Parget | 56 |
| 10 | “ | Jewelers' Set of 36 Drills, No. 30 (⅛) to No. 65, Wire Gauge... | Parial | 56 |
| 11 | “ | Letter Size Straight Shank Drills, A to Z..................... | Pariers | 56 |
| 13 | “ | Bit Stock Drills, $\frac{1}{16}$ to ¼ inch by 32nds, $\frac{5}{16}$ to ⅜ inch by 16ths.. | Parish | 55, 56 |
| 13A | “ | Wood Bits for Brace, $\frac{1}{16}$ to ¼ inch by 32nds, $\frac{5}{16}$ to ⅜ inch by 16ths | Parisin | 54, 56 |
| 13B | “ | Wood Bits for Brace, ⅛ to ¼ inch by 32nds, $\frac{5}{16}$ to ⅜ inch by 16ths | Park | 54, 56 |
| 14B | “ | Bit Stock Drills, ⅛ to ¼ inch by 32nds, $\frac{5}{16}$ to ⅜ inch by 16ths.. | Parlance | 55, 56 |
| 15 | “ | "Ezy-Out" Screw Extractors, Nos. 1, 2, 3, 4 and 5.......... | Parlanceda | 142 |
| 15A | “ | "Ezy-Out" Screw Extractors, Nos. 1, 2, 3, 4, 5 and 6........ | Parlancefy | 143 |
| 16 | “ | "Ezy-Out" Screw Extractors, Nos. 6, 7, 8 and 9........... | Parlancego | 143 |
| 17 | “ | "Ezy-Out" Screw Extractors, Nos. 4, 5 and 6.............. | Parlancett | 142 |
| 18 | “ | Short Set Straight Shank Drills, $\frac{1}{16}$ to $\frac{3}{16}$ inch by 64ths........ | Parlancide | 53, 56 |
| 19 | “ | Drills and Countersinks combined, comprising sizes A1, C2, D1, D2, E1, E2, F1, F2....... | Parland | 60 |
| 20 | Set | "Ezy-Out" Screw Extractors, Nos. 1, 2, 3, 4, 5 and 6, and Straight Shank Drills......... | Parlander | 142 |
| 22 | “ | Short Set Straight Shank Drills, $\frac{1}{16}$ to ¼ inch (11 drills)....... | Parlangu | 53, 56 |

# Numerical Index with Code Words

### Tools in Sets (*Continued*)

| List No. | Description | Code Word | Page No. |
|---|---|---|---|
| 26 Set | Short Set Straight Shank Drills, $\frac{1}{16}$ to $\frac{9}{32}$ inch (8 drills)........ | Parlant | 50, 56 |
| 27A “ | Hand Reamers, $\frac{1}{4}$ to 1 inch by 16ths, in cases............... | Parlapel | 95 |
| 27B “ | Hand Reamers, $\frac{1}{4}$ to 1$\frac{1}{4}$ inch by 16ths, in cases............... | Parlaque | 95 |
| 27C “ | Hand Reamers, $\frac{1}{4}$ to 1$\frac{1}{2}$ inch by 16ths, in cases.............. | Parlatch | 95 |
| 27E “ | Hand Reamers, $\frac{1}{4}$ to 1 inch by 32nds, in cases.............. | Parlava | 95 |
| 27F “ | Hand Reamers, $\frac{1}{4}$ to 1 inch by 32nds, and 1$\frac{1}{16}$ to 1$\frac{1}{4}$ inch by 16ths, in cases.............. | Parlawyer | 95 |
| 27G “ | Hand Reamers, $\frac{1}{4}$ to 1 inch by 32nds, and 1$\frac{1}{16}$ to 1$\frac{1}{2}$ inch by 16ths, in cases.............. | Parlazy | 95 |
| 30 “ | Taper Pin Reamers, Nos. 0 to 5, in cases.................... | Parleapt | 95 |
| 32 “ | Socket Reamers, Nos. 1 to 5, in cases...................... | Parleave | 95 |
| 35 “ | Taper Pin Reamers, Nos. 0 to 5, spiral flute, in case........... | Parlement | 95 |
| 36 “ | Hand Reamers, spiral fluted, 12 sizes in case................ | Parlenz | 95 |
| 42 “ | Quick-Set Adjustable Reamers, C, D, E, F, G, H, in case...... | Parleying | 94 |
| 44 “ | Quick-Set Adjustable Reamers, sizes A, B, C, D, E, F, G, H, I, J, K, in case.............. | Parliagent | 93 |
| 45 “ | Quick-Set Adjustable Reamers, sizes A, B, C, D, E, F, G, H, in case.................... | Parliagyze | 93 |
| 46 “ | Quick-Set Adjustable Reamers, sizes 4/A, 3/A, 2/A, in case... | Parlial | 94 |
| 49 “ | Drills and Countersinks combined — High Speed Sets in Boxes, sizes A1, C2, D1, E1, E2, F1, F2................ | Parliance | 60 |
| 50 Set | Short Set Straight Shank Drills, $\frac{1}{16}$ to $\frac{1}{2}$ inch by 64ths, mounted | Parlid | 52, 56 |
| 51 “ | Short Set Straight Shank Drills. $\frac{1}{16}$ to $\frac{1}{2}$ inch by 64ths, mounted on metal stand, in dustproof metal carrying case.......... | Parlife | 48 |
| 52 “ | Wire Gauge Drills, No. 1 to No. 60, mounted on metal stand, in dustproof metal carrying case. | Parlight | 49 |

# Numerical Index with Code Words

## Tools in Sets (*Continued*)

| List No. | | Description | Code Word | Page No. |
|---|---|---|---|---|
| 54 | Set | Short Set Straight Shank Drills, High Speed, $\frac{1}{16}$ to $\frac{1}{2}$ inch by 64ths, not mounted.......... | Parlorish | 52, 56 |
| 55 | “ | Straight Shank High Speed Drills, Letter Size A to Z, mounted on Block.................... | Parlorn | 56 |
| 56 | “ | Short Set Straight Shank Drills, $\frac{1}{16}$ to $\frac{1}{4}$ inch (11 drills), High Speed.................... | Parlort | 53, 56 |
| 57 | “ | Short Set Straight Shank Drills, $\frac{1}{16}$ to $\frac{9}{32}$ inch (8 drills), High Speed.................... | Parlorty | 51, 56 |
| 58 | “ | Short Set Straight Shank Drills, High Speed, $\frac{1}{16}$ to $\frac{1}{2}$ inch by 64ths, mounted on metal stand, in dustproof metal carrying case | Parlot | 48 |
| 59 | “ | Wire Gauge Drills, No. 1 to No. 60, High Speed, mounted on metal stand, in dustproof metal carrying case................ | Parlotion | 49 |
| 60 | “ | Short Set Straight Shank Drills, 1 millimeter to 6.5 millimeters by .1 millimeter, on metal stand | Parlous | 56 |
| 80 | “ | Wire Gauge Drills, No. 1 to No. 60, on metal stand........... | Parody | 52, 56 |
| 84 | “ | Wire Gauge Drills, High Speed, No. 1 to No. 60, not mounted. | Parosmia | 52, 56 |

## Specials

| List No. | Description | Code Word | Page No. |
|---|---|---|---|
| | Dual Cut Drills.................. | ............ | 32 |
| | Reamers.......................... | ............ | 137, 138 |
| | Step Drills...................... | ............ | 46 |

## General

| List No. | Description | Code Word | Page No. |
|---|---|---|---|
| 04 | Drill Cases.................... | Laagered | 58 |
| 06 | Drill Case Drawers............. | Laane | 58 |
| 07 | Drill Cabinet, Metal Display.... | Laap | 57 |
| 12 | Three-Fluted Taper Shank Drills | Lab | 24 |
| 21 | Four-Fluted Taper Shank Drills | Labacing | 24 |
| 24 | Three-Fluted Straight Shank Drills.................... | Labacist | 25 |

# Numerical Index with Code Words

## General (*Continued*)

| List No. | Description | Code Word | Page No. |
|---|---|---|---|
| 25 | Four-Fluted Straight Shank Drills | Labacite | 25 |
| 78 | Patent Arbors, Straight Shank | Labacitony | 80 |
| 79 | Patent Arbors, Taper Shank | Labacitort | 80 |
| 91 | Taper Shank Oil Tube Drills | Labag | 45 |
| 91A | Taper Shank Oil Hole Drills | Labagged | 45 |
| 95 | Bonding Drills | Labalm | 38 |
| 96 | Bell Type Countersinks | Labar | 59 |
| 98 | Drills and Countersinks combined | Labate | 59 |
| 99 | Straight Shank Oil Tube Drills | Labefied | 45 |
| 99A | Straight Shank Oil Hole Drills | Labegand | 45 |
| 100 | Rough Sockets | Labegander | 7 |
| 102 | Fitted Sockets | Labegawn | 7 |
| 103 | Screw Machine Socket | Labajean | 8 |
| 104 | Sleeves or Shell Sockets | Labejeft | 8 |
| 105 | Drifts or Center Keys | Labejohn | 9 |
| 106 | Taper Shank Drills | Label | 18, 19 |
| 108 | Straight Shank Drills, Short Set | Labium | 27 |
| 108A | Straight Shank Drills, Wire Gauge | Labor | 28, 29 |
| 109 | Straight Shank Drills, Letter Size | Laboring | 29 |
| 110 | Straight Shank Drills, Long Set | Laborless | 20, 21 |
| 111 | Ratchet Drills, Square Taper Shank, No. 1 | Labrax | 36 |
| 111 | Ratchet Drills, Square Taper Shank, No. 2 | Labrum | 36 |
| 112 | Tell-Tale Drills | Laces | 37 |
| 112A | Tell-Tale Drills, Long Set | Labig | 37 |
| 113 | Coopers' Dowel Drills | Lacing | 41 |
| 113A | Straight Shank Drills for Wood | Lack | 41 |
| 114 | Bit Stock Drills | Lackey | 39 |
| 114A | Wood Bits for Brace | Laconic | 40 |
| 114E | Bell Hangers' Bits | Lacteal | 40 |
| 115A | Machine Countersinks, ½ inch Shank | Lactor | 61 |
| 116 | Blacksmiths' Drills, ⅝ inch Shank | Ladder | 34 |
| 118 | Blacksmiths' Drills, ½ inch Shank, Long Set | Ladle | 35 |
| 120 | Blacksmiths' Drills, ½ inch Shank, Short Set | Ladrone | 33 |
| 122 | Machine Bits for Wood, Straight Shank | Lady | 43 |
| 122A | Machine Bits for Wood, ½ inch Shank, 2½ inches long | Ladyship | 42 |
| 122B | Machine Bits for Wood, Taper Shank | Lafferty | 42 |

## Numerical Index with Code Words

### General (*Continued*)

| List No. | Description | Code Word | Page No. |
|---|---|---|---|
| 123 | Bobbin Bit | Lafty | 31 |
| 125 | Center Drills | Lagers | 37 |
| 125A | Center Reamers | Laggard | 61 |
| 126 | Expansion Reamers, Spiral Fltd. | Laird | 67 |
| 128A | Hand Reamers | Lamb | 68, 69 |
| 128B | Taper Shank Jobbers' Reamers | Lambert | 71 |
| 128C | Hand Reamers, Spiral Fluted | Lambia | 70 |
| 129 | Expansion Reamers | Lambkin | 66 |
| 130A | Fluted Shell Reamers | Lamech | 77, 78 |
| 130C | Shell Reamers, Spiral Fluted | Lamedal | 79 |
| 133 | Arbors for Shell Reamers | Lamentable | 81, 124 |
| 133A | Taper Shank Arbors for Shell Reamers | Lamenting | 81, 124 |
| 134 | Fluted Chucking Reamers, Straight Shank | Lampoon | 72 |
| 134A | Fluted Chucking Reamers, Taper Shank | Lancelo | 73, 74 |
| 136 | Rose Chucking Reamers, Straight Shank | Landau | 75 |
| 137 | Taper Pin Reamers | Landbank | 85 |
| 137A | Bit Stock Taper Reamers | Landbeam | 88 |
| 139 | Taper Pin Reamers, Spiral Fluted | Lander | 85 |
| 140 | "Spirex Machine Taper Pin Reamers | Landez | 86 |
| 141 | Locomotive Reamers, Taper | Landfall | 84 |
| 142 | Repairman's Taper Reamers | Landing | 88 |
| 143 | Mandrels | Landlady | 153 |
| 144 | Socket Reamers, Finishing | Landlag | 90 |
| 144A | Socket Reamers, Roughing | Landlagger | 90 |
| 144B | Socket Reamers with Taper Shanks, Finishing | Landlaggy | 90 |
| 144C | Socket Reamers with Taper Shanks, Roughing | Landlake | 90 |
| 145 | Straight Shank Straight Fluted Drills, Short Set | Landless | 44 |
| 147 | Taper Shank Straight Fluted Drills | Landlord | 44 |
| 148 | Quick-Set Adjustable Reamers | Landlorder | 91, 92 |
| 150A | Bridge Reamers, Taper Shanks | Landlower | 82 |
| 151 | Rose Chucking Reamers, Taper Shanks | Landlubber | 76 |
| 154 | Die-Sinking Reamers—Spirex | Landrut | 87 |
| 157 | Locomotive Reamers, Taper Shank, Taper $\frac{1}{16}$ inch to foot | Landscear | 84 |
| 158 | Taper Locomotive Reamers, 6 Fluted, Square Shank | Landsceby | 84 |

# Numerical Index with Code Words

**General** (*Continued*)

| List No. | Description | Code Word | Page No. |
|---|---|---|---|
| 159 | Taper Locomotive Reamers, 6 Fluted, Taper Shank.......... | Landscedal | 84 |
| 160 | Straight Shank Straight Fluted Drills, Long Set.............. | Landscene | 44 |
| 166 | Straight Shank Straight Fluted Drills, Wire Gauge........... | Landskit | 44 |
| 169 | Machine Bits for Wood, ½ inch Shanks, 2 inches long......... | Landson | 43 |
| 176 | Straight Shank Counterbores... | Landsore | 150 |
| 177 | Taper Shank Counterbores..... | Landsower | 151 |
| 180 | Hollow Mills, Plain, for Brass... | Landsquall | 154 |
| 181 | Hollow Mills, Plain, for Steel.... | Landsqueak | 154 |
| 182 | Hollow Mills, Adj., for Brass.... | Landsquib | 155 |
| 183 | Hollow Mills, Adj., for Steel..... | Landsquire | 155 |
| 184 | Straight Shank End Mills....... | Landstar | 156 |
| 185 | End Mills, Spiral Fluted, Taper Shank...................... | Landsuds | 157 |
| 186 | End Mills, Spiral Fluted, Brown & Sharpe Shanks............ | Landsyrup | 158 |
| 192 | "Ezy-Out" Screw Extractors.... | Landtape | 141 |
| 196 | Patent Arbors for Shell End Mills, Brown & Sharpe Shank....... | Landtaste | 163 |
| 232-244 | Burring Reamers, Spiral Flutes. | | 89 |
| 260 | Six Sets of Short Set Straight Shank Drills (Set No. 26), Packed in Display Carton..... | Lanol | 50, 56 |
| 301 | "Paradox" Shell Reamers....... | Leader | 131 |
| 306 | "Paradox" Hand Reamers....... | Leaderless | 134 |
| 312 | "Paradox" Chucking Reamers, Straight Shank.............. | Leading | 135 |
| 317 | "Paradox" Chucking Reamers, Taper Shank................ | Leadwall | 136 |
| 335 | Patent Arbors for "Paradox" Shell Reamers, up to 3 inches diameter—Straight Shank.... | League | 133 |
| 336 | Patent Arbors for "Paradox" Shell Reamers, up to 3 inches diameter—Taper Shank...... | Leakage | 133 |
| 501 | "Peerless" Hand Reamers....... | Loader | 99 |
| 502 | "Peerless" Hand Reamers, Expansion..................... | Loaf | 100 |
| 503 | "Peerless" Chucking Reamers, Straight Shank.............. | Loamy | 101 |
| 504 | "Peerless" Chucking Reamers, Expansion, Straight Shank.... | Laoned | 103, 104 |

# Numerical Index with Code Words

## General (*Continued*)

| List No. | Description | Code Word | Page No. |
|---|---|---|---|
| 509 | "Peerless" Core Reamers, Straight Shank | Locale | 105 |
| 510 | "Peerless" Expansion Core Reamers, Straight Shank | Locker | 106 |
| 515 | "Peerless" Chucking Reamers, Taper Shank | Logwood | 107 |
| 516 | "Peerless" Expansion Chucking Reamers, Taper Shank | Loop | 108 |
| 517 | "Peerless" Core Reamers, Taper Shank | Loophole | 109 |
| 518 | "Peerless" Expansion Core Reamers, Taper Shank | Lotion | 110 |
| 519 | "Peerless" Shell Reamers | Lottery | 111 |
| 520 | "Peerless" Expansion Shell Reamers | Lotto | 114 |
| 521 | "Peerless" Shell Core Reamers | Loved | 111 |
| 532 | Arbors for "Peerless" Shell Reamers | Loveset | 112 |
| 533 | Arbors for "Peerless" Shell Reamers, Taper Shank | Lovesick | 112 |
| 534 | "Peerless" Adjusting Wrenches | Lovesome | 115 |
| 535 | "Peerless" Arbors for Expansion Shell Reamers | Loveworthy | 113 |
| 536 | "Peerless" Arbors for Expansion Shell Reamers, Taper Shanks. | Loving | 113 |
| 537 | Adjusting Wrenches for "Peerless" Reamers, Lists Nos. 504, 510, 516, 518 | Lovewrath | 102 |
| 570 | Six Sets of Short Set Straight Shank Drills (High Speed Set No. 57), Packed in Display Carton | Lovlight | 51, 56 |
| 601 | "Paradox" Shell Reamers, High Speed Blades | Lowborn | 131 |
| 602 | "Paradox" Hand Reamers, High Speed Blades | Lowboy | 134 |
| 603 | "Paradox" Chucking Reamers, Straight Shank, High Speed Blades | Lowbred | 135 |
| 604 | "Paradox" Chucking Reamers, Taper Shank, High Speed Blades | Lowbrow | 136 |
| 606 | Shell Adjustable, High Speed....<br>(See pages 125-127 for Parts) | Lowcab | 121, 122 |
| 607 | Chucking Adjustable, Straight Shank, High Speed | Lowcet | 120 |

## Numerical Index with Code Words

| General (*Continued*) | | | |
|---|---|---|---|
| List No. | Description | Code Word | Page No. |
| 608 | Chucking Adjustable, Taper Shank, High Speed.......... (See pages 125-127 for Parts) | Lowcow | 119 |
| 610 | Center Reamers, High Speed.... | Lowdeck | 61 |
| 613 | Bridge Reamers, Taper Shank, High Speed, Three-Fluted.... | Lowearl | 82 |
| 615 | Bridge Reamers, Taper Shank, High Speed................ | Loweave | 82 |
| 616 | Bridge Reamers, Taper Shank, Spiral Fluted............... | Loweavell | 82 |
| 617 | Car Reamers, Taper Shank, Straight Fluted.............. | Loweaving | 83 |
| 618 | Car Reamers, Taper Shank, Spiral Fluted............... | Lowedding | 83 |
| 620 | Fluted Shell Reamers, High Speed | Lower | 77, 78 |
| 624 | Hand Reamers, High Speed..... | Lowermost | 68, 69 |
| 628 | Taper Shank Jobbers' Reamers, High Speed................ | Lowery | 71 |
| 630 | Fluted Chucking Reamers, Straight Shank, High Speed... | Lowlived | 72 |
| 632 | Fluted Chucking Reamers, Taper Shank, High Speed..... | Lowmind | 73, 74 |
| 634 | Rose Chucking Reamers, Straight Shank, High Speed... | Lowneck | 75 |
| 636 | Rose Chucking Reamers, Taper Shank, High Speed..... | Loyal | 76 |
| 638 | Locomotive Reamers, Straight Shank, High Speed. Taper $\frac{1}{16}$ inch to foot............ | Loyalty | 84 |
| 640 | Locomotive Reamers, Taper Shank, High Speed. Taper $\frac{1}{16}$ inch to foot............ | Lozenge | 84 |
| 645 | Spiral Fluted Hand Reamers, High Speed................ | Lubricate | 70 |
| 646 | Spiral Fluted Shell Reamers, High Speed................ | Lubricity | 79 |
| 647 | Taper Locomotive Reamers, 4 Fluted, Square Shank, High Speed.................... | Lucid | 84 |
| 648 | Taper Locomotive Reamers, 4 Fluted, Taper Shank, High Speed.................... | Lucifer | 84 |
| 649 | "Quick-Set" Adjustable Reamers, High Speed............. | Lucre | 91, 92 |
| 650 | "Spirex" Machine Taper Pin Reamers, High Speed......... | Lucy | 86 |
| 651 | Taper Locomotive Reamers, 6 Fluted, Square Shank, High Speed.................... | Luda | 84 |

## Numerical Index with Code Words

### General (*Continued*)

| List No. | Description | Code Word | Page No. |
|---|---|---|---|
| 652 | Taper Locomotive Reamers, 6 Fluted, Taper Shank, High Speed | Ludacing | 84 |
| 654 | Die-Sinking Reamers — Spirex, High Speed | Ludale | 87 |
| 657 | Taper Pin Reamers, Straight Flute, High Speed | Luder | 85 |
| 659 | Taper Pin Reamers, Spiral Flute, High Speed | Ludial | 85 |
| 660 | Hollow Mills, Plain, for Brass, High Speed | Ludicrous | 154 |
| 661 | Hollow Mills, Plain, for Steel, High Speed | Ludlam | 154 |
| 662 | Hollow Mills, Adj., for Brass, High Speed | Ludson | 155 |
| 663 | Hollow Mills, Adj., for Steel, High Speed | Ludwig | 155 |
| 671 | Shell End Mills, Spiral Fluted, High Speed | Lug | 162 |
| 674 | End Mills, Straight Shank, High Speed | Lugworm | 156 |
| 675 | End Mills, Spiral Fluted, Taper Shanks, High Speed | Luke | 157 |
| 676 | End Mills, Spiral Fluted, Brown & Sharpe Taper Shanks, High Speed | Lukewarm | 158 |
| 677 | End Mills, Spiral Fluted, Coarse Tooth | Lukim | 159 |
| 678 | End Mills, Two Lipped Slotting, Straight Flute, B & S Taper Shank, High Speed | Lukot | 160 |
| 679 | End Mills, Two Lipped Slotting, Spiral Flute, B & S Taper Shank, High Speed | Lukpail | 160 |
| 680 | End Mills, Two Lipped Slotting, Straight Flute, Straight Shank, High Speed | Lukpar | 161 |
| 681 | End Mills, Two Lipped Slotting, Spiral Flute, Straight Shank, High Speed | Lukpate | 161 |
| 876 | Straight Shank Counterbores, High Speed | Luster | 150 |
| 877 | Taper Shank Counterbores, High Speed | Lustering | 151 |
| 878 | Taper Shank, Short Set, Counterbores and Spot Facers, High Speed | Lusto | 145, 146 |

# Numerical Index with Code Words

**General** (*Continued*)

| List No. | Description | Code Word | Page No. |
|---|---|---|---|
| 879 | Straight Shank, Short Set, Counterbores and Spot Facers, High Speed | Lustrous | 147, 148 |
| 890 | Lathe Centers | Lute | 152 |
| 907 | Three-Fluted Taper Shank Drills, High Speed | Macadam | 23 |
| 909 | Three-Fluted Straight Shank Drills, High Speed | Mace | 25 |
| 914 | Ratchet Drills, High Speed, Square Shank, No. 1 | Macham | 36 |
| 914 | Ratchet Drills, High Speed, Square Shank, No. 2 | Macho | 36 |
| 917 | Straight Shank Drills, Short Set, High Speed | Mackerel | 27 |
| 918 | Straight Shank Drills, Wire Gauge, High Speed | Madam | 28, 29 |
| 919 | Straight Shank Drills, Letter Size, High Speed | Madcap | 29 |
| 920 | Straight Shank Drills, Short Set, High Speed, millimeter sizes | Madder | 170, 171 |
| 924 | "Bakelite" Type, Short Set, Fraction Sizes, High Speed | Magician | 30 |
| 925 | "Bakelite" Type, Short Set, Wire Gauge Sizes, High Speed | Magistrate | 30 |
| 926 | Oil Tube Drills, Taper Shank, High Speed | Magnet | 45 |
| 926A | Oil Hole Drills, Taper Shank, High Speed | Magnify | 45 |
| 929 | Straight Shank Oil Tube Drills, High Speed | Mahoe | 45 |
| 929A | Oil Hole Drills, Straight Shank, High Speed | Maiden | 45 |
| 931 | Blacksmiths' Drills, 5/8 inch Shanks, High Speed | Mailclad | 34 |
| 936 | Blacksmiths' Drills, 1/2 inch Shank, Short Set, High Speed | Mainmast | 33 |
| 938 | Four-Fluted Drills, Taper Shank, High Speed | Maintain | 23 |
| 939 | Four-Fluted Drills, Straight Shank, High Speed | Maize | 25 |
| 940 | CLE-FORGE High Speed Drills, Regular Taper Shank | Major | 13–17 |
| 941 | CLE-FORGE High Speed Drills, with Taper Shanks smaller than regular | Majority | 13–17 |
| 942 | CLE-FORGE High Speed Drills, with Taper Shanks larger than regular | Maker | 13–17 |

# Numerical Index with Code Words

## General (*Continued*)

| List No. | Description | Code Word | Page No. |
|---|---|---|---|
| 943 | CLE-FORGE High Speed Drills, Taper Shank, millimeter sizes. | Malice | 164–166 |
| 944 | Bonding Drills, High Speed..... | Mallet | 38 |
| 945 | CLE-FORGE High Speed Drills, Taper Shank, Smaller than Regular, millimeter sizes...... | Mallow | 164–166 |
| 946 | Shell Drills, High Speed......... | Malt | 26 |
| 948 | Track Drills, High Speed, Flat.. | Mammon | 38 |
| 950 | CLE-FORGE High Speed Drills, Straight Shank.............. | Manager | 20, 21 |
| 951 | Tell-Tale Drills, High Speed, Long Set.................. | Mandate | 37 |
| 952 | Tell-Tale Drills, High Speed..... | Mandolin | 37 |
| 953 | Tell-Tale Drills, Three-Fluted, CLE-FORGE High Speed.... | Mandrake | 37 |
| 954 | CLE-FORGE High Speed Drills, Straight Shank, Long Set, millimeter sizes................. | Mangle | 169 |
| 957 | "Hy-Spiral" Drills, High Speed. | Mango | 30 |
| 958 | Bobbin Bit................... | Mangrew | 31 |
| 996 | Bell Type Countersinks......... | Masold | 59 |
| 998 | Drills and Countersinks combined, High Speed........... | Mason | 59 |
| 1152 | Taper Shank Drills, millimeter sizes...................... | Mimic | 167, 168 |
| 1153 | Straight Shank Drills, Long Set, millimeter sizes.............. | Mincing | 169 |
| 1154 | Straight Shank Drills, Short Set, millimeter sizes.............. | Minister | 170, 171 |
| 1196 | Hand Reamers, millimeter sizes. | Missile | 172 |
| 1207 | Straight Shank, Wire Gauge for brass...................... | Moan | 31 |
| 1208 | Straight Shank, Short Set for brass...................... | Moaning | 31 |
| 1308 | "Hy-Spiral" Drills............. | Nap | 30 |

C